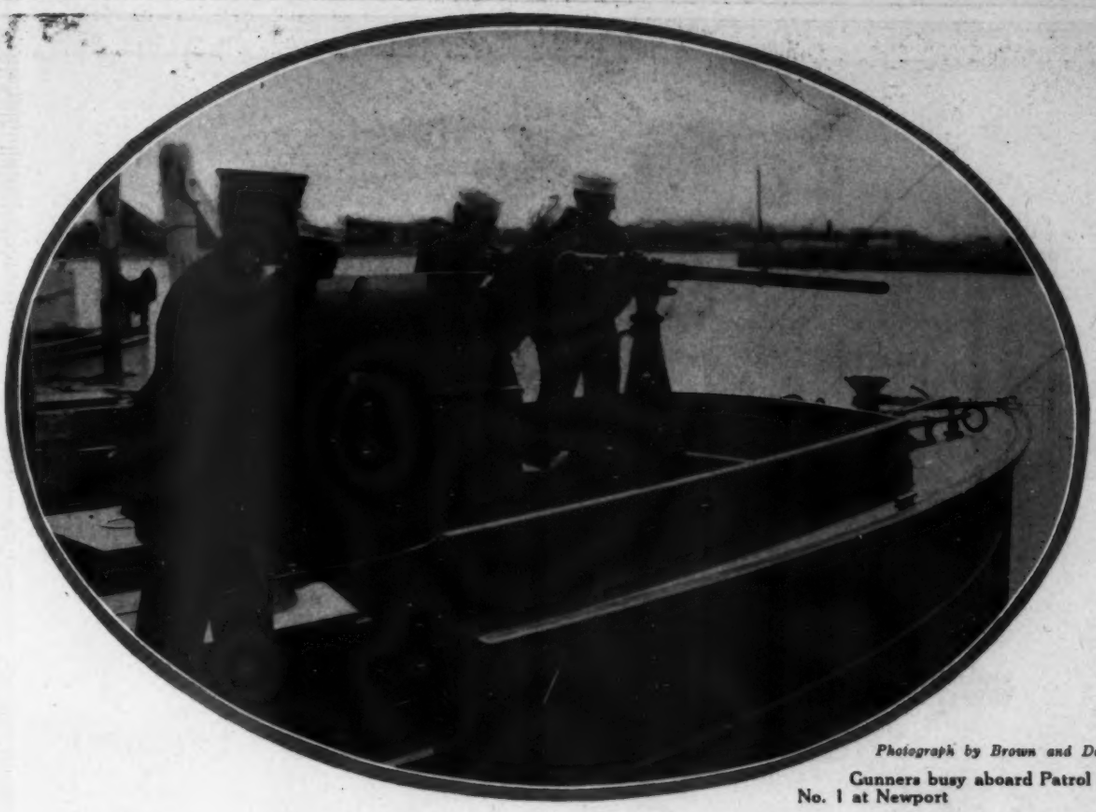

Photograph by Brown and Dawson

Gunners busy aboard Patrol Boat No. 1 at Newport

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June, 1917 — MOTOR BOATING — Vol. XIX, No. 6

THE NATIONAL MAGAZINE OF MOTOR BOATING

Entered as second-class matter at New York, N. Y., Post Office.

Copyright, 1917, by International Magazine Co. (MoToR BoatinG).

Published Monthly by International Magazine Company, 119 West Fortieth Street, New York City

G. L. Willson, President — W. G. Langdon, Secretary — S. S. Carvalho, Treasure.

Telephone: Bryant 6000 — Cable Address: Motoria

15 cents a copy. Subscription, $1.50 a year. Extra Canadian postage, 50 cents. Extra foreign postage, $1.00.

Built for Service

WE NOW HAVE under course of construction, designed for the purpose of active service and embodying the consequential requisites of structural strength, stability, seaworthiness and speed, a ***"submarine chaser" type***

Fifty Foot Patrol Cruiser

By the use of sawn frames, steam-bent ribs and battens running from stem to transom, all spaced on short centers, forming a laminated framework of great strength and rigidity and backing up every plank seam, the hull of this Cruiser is made practically indestructible, and the possibility of seams opening up in any seaway absolutely precluded.

The gun-platform, too, is specially constructed, being carried to the keel and doubly reinforced to amply take care of the "one-pounder" it mounts. This construction is in accordance with the recommendation of authorities who have made a special study of the Patrol Cruiser situation.

As to equipment, this Cruiser lacks not one essential thing. It is delivered ready for operation, even including a Blinker Signal Set and other fittings peculiar to the requirements of the Patrol Squadron Fleet.

Accommodations are afforded for two officers and a crew of six; and fuel and water tanks are provided for a cruising radius of over five hundred miles.

If you are interested in a boat of this type, communicate with us immediately for detailed specifications. Our production capacity is necessarily limited and deliveries will be determined upon priority of receipt of orders.

Great Lakes Boat Building Corporation

MILWAUKEE, WISCONSIN

Designers and Builders of Boats of Distinction and Quality

One of the completed 80-footers of which 550 were built by the Elco Co. *Photographs by Rosenfeld, N. Y.*

Hundreds of Submarine Chasers

One American Plant Manufactures 550 Eighty-Footers in a Few Months—Methods of Production the Last Word in Standardized Manufacturing Practice

By Henry R. Sutphen

SOME six months after the declaration of war by the European Powers, it was my privilege to have a conference with a well-known British naval authority, who was in this country on a secret mission for his country. Naturally, the trend of our conversation drifted into a discussion of the naval side of the great war, particularly that phase dealing with under-sea craft. At that time the German submarine warfare had not been extended to its present scale, yet the foresight of all British naval officers led them to believe that in time the U-boats would be a real menace, and that steps must be taken to discover a defensive weapon to combat them.

The naval authority asked my opinion on this important question, and while I had been giving the subject serious thought for some time, yet I had no idea that I would ever be asked for suggestions from one so high up in naval affairs. However, I suggested that in my opinion the only solution to the menace was the employment of a large number of small armed motor boats, having sufficient speed and seaworthiness so that they might outmaneuver any U-boat. My idea was to have a fleet of these boats of sufficient size to thoroughly patrol all of the waters around Great Britain, its harbors, etc.

Two distinct types of boats had been fixed in my mind for some time as possibilities for this kind of service—one of about 50-foot length, and the other in the neighborhood of 80 feet. The former was to be strictly a high-speed proposition, and capable of speeds of about 30 miles an hour; the other type of boat being larger would naturally prove more seaworthy, and would be able to go out to sea for greater distances, and stay there for a considerable period of time with minimum discomfort to her crew. Such a type should have a maximum speed of 19 or 20 knots, and an average speed of 15 knots, with a cruising radius of nearly 1,000 miles.

My English friend asked me how many of either type of boat I thought could be built by my company within a year, and by stretching my imagination to the utmost I told him that it would be possible to guarantee fifty boats. Needless to say, I had no idea at the time I made this statement of the truly tremendous task that lay before me. Within a few days I had another interview with the naval man, and he informed me that his Government was ready to give my company an order for fifty vessels of the larger type if I could guarantee delivery within a year.

The question of how the work could be consummated without embarrassment to our own Government, on account of the neutrality laws, was given serious consideration. It was suggested that Canada offered a convenient field of operation, and immediately we went to Montreal and Quebec, and ran down all clues which appeared to have any possibilities. Of course, nowhere could we find a shop or boat yard suitably located or equipped for turning out a job of this magnitude. At Quebec

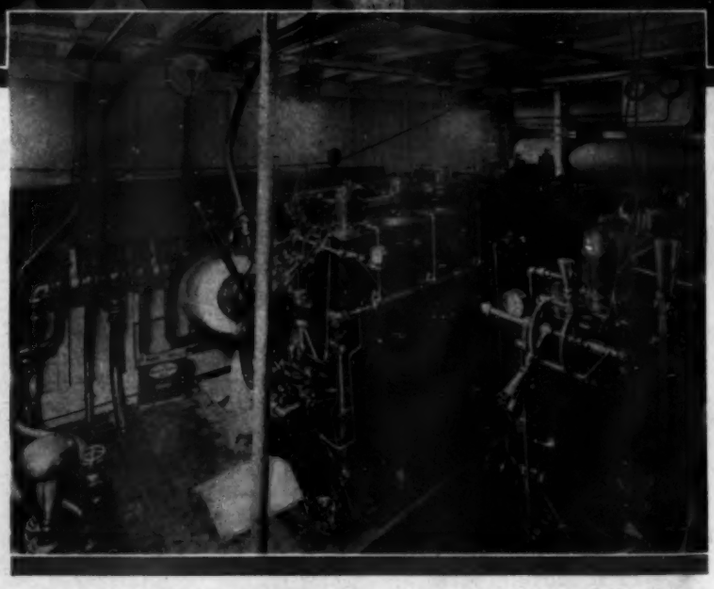
A view of one corner of the shop showing sixteen of the boats in frame

we found a small repair yard which presented the greatest possibilities, and took an option on this property.

On April 9, 1915, the contract for fifty submarine chasers was signed, and the work begun in earnest. It was at once apparent that the secret of our success lay in scientific standardization. Our chief designer, Mr. Chase, with his usual keen foresight and far-reaching judgment, was quick to recognize these conditions.

Our Bayonne plant was utilized to build a master or pattern boat, and this was really the biggest part of the job. After we had templates, molds, and patterns for the first boat, it was comparatively easy sledding, the rest being simply a matter of duplication. The Canadian plant was used only for assembling. All the fabrication was done at Bayonne. The men in Canada who put the boats together were only ordinary wood workers, and there was hardly a boat builder among them. Very few could even speak English. No cutting, fitting or shaping of any kind was necessary. Hull frames, plank shears, joiner work were all made to exact pattern, every separate piece being lettered and numbered so that they went together precisely and easily into their appointed places. At the Bayonne yard elaborate charts were kept showing the progress of the manufacturing.

It was imperative that the big pieces, such as the decking and keel frames, should be kept within railway clearances for the bridges and tunnels. On this account we were unable to ship by direct route, and the material, all in knock-down form, had to go by the Suspension Bridge and Buffalo.



The motor room on one of the boats with its two 220 h.p. Standards

Hardly a month after the work had begun we received a cablegram from England ordering an additional 500 chasers, so that instead of the original fifty we were supposed to build, we were required to construct 550 of these boats, and deliver them in running order by November 15, 1916. This would give us an actual working schedule of only 501 days, which meant we must turn out more than one boat a day on the average. Naturally, our plans had to be considerably changed. We greatly enlarged our Quebec plant, and established another at Montreal, but we met the task squarely from the shoulder,

A few of the chasers nearing completion

The officers' quarters are as comfortable as an owner's stateroom on a large motor yacht

and brought it to a successful end, and with something to spare. The original order for the fifty boats was cleaned up in November, 1915—four months ahead of time—and the whole lot was delivered by November 1, 1916, giving us a whole fortnight's leeway.

According to our contract we were to make all deliveries at the launching slips in the St. Lawrence River, and the Admiralty wanted as many boats as it could get before the close of navigation in late November. We shipped the first fifty, and then the ice came and stopped us. It was then suggested that the boats, as fast as they were completed, be shipped by rail to Halifax. We agreed to this, provided the railway company could handle the boats in a completed form. We constructed a skeleton model, which was mounted on a lumber car and sent over the thousand-mile stretch of railway to Halifax. Traffic inspectors accompanied the car, and noted the difficulties encountered. It was necessary to remove a number of semaphore signals, and change the track in several places. But this sort of work was quickly accomplished and shipment of the completed boats by rail was begun. Each boat was carried on a 60-foot lumber car with trailers at each end to take care of the overhang. The boats stood the strain of the long rail trip without developing any structural weaknesses, and upon their arrival at Halifax were given a trial trip in the harbor, and loaded for shipment to England. In all, eighty-four boats were sent over the rail route up to February, 1916.

The boats were thoroughly tested by running each one over a carefully measured trial course, and one out of each twenty-five was put through a special and more thorough test. The contract required that the boats show a maximum speed of 19 knots, carrying full fuel tanks and sufficient extra weight to make their displacement equivalent to what it would be in actual service. They must also show an average speed of 15 knots on a four-hour test.

In shipping the boats to England each ship carried four of the chasers, and in all a fleet of 130 transports was required to take over the 550 boats, including a quantity of spare and standardized parts. Every boat arrived safely on the other side.

(*Continued on page* 54)

Eugene A. Riotte, president of the Standard Motor Construction Co., the man whose executive ability made it possible to produce the immense number of powerful engines required to equip the British submarine chasers. In the background will be seen a number of the chasers nearly ready for launching

American Motors for British Chasers

Over Eleven Hundred Marine Motors Built by One American Manufacturer to Fight the U-Boats—A Mighty Task Successfully Completed on Time by the Standard Motor Construction Co.

ONE order for more than 1,100 marine engines to develop at least 220 h.p. at 400 r.p.m., have a fuel consumption not to exceed a certain amount, and each and every motor to be of a kind which would start through the mere touch of the finger, would stop dead from full speed ahead, and reverse almost instantly from full speed ahead to full speed astern—in short, have all the advantages and control of a modern steam plant, without the latter's disadvantages. Such was the problem that confronted E. A. Riotte, president of the Standard Motor Construction Co., when his company took the orders and signed the contracts for supplying the power plants to be used in the 550 submarine chasers which the Elco Co. was to build for the English Government. Furthermore, deliveries must be made within a very limited time, hardly more than a year being allowed for completing the order.

What the problems really meant can hardly be grasped by the lay mind. To the average builder of marine motors an order of this magnitude would have been staggering, but not so with the Standard company, although it was the largest single order it had ever received. Due to the organization of the company, and the efficiency of its plant, as well as to the fact that each department formed a cog, as it were, in the big machine, it was able to fill the order with less trouble and excitement than generally attends an order for a single engine with some concerns.

In the first place, it was necessary for the Standard company to arrange with over 200 other firms for a part or the whole of their production. Unconsciously, the company cornered the crankshaft market several times. Over 2,900 tons of cast iron alone were required, together with 2,200 tons of steel, 474 tons of phosphor bronze, 390 tons of brass, 115 tons of copper, besides a great quantity of aluminum, galvanized iron, and many tons of miscellaneous material. If all of this material were placed in freight cars, and handled in one train, it would require one having a length of almost three miles.

More important than the above was the generalship required at the center of operations for overseeing the manufacturing and shipping details, to say nothing of the generalship required in various branches of the shop.

If it were possible for one to go through the Standard factory, he would fully understand why and how it was that this concern was able to bring its great task to such a successful conclusion.

The engineering department has carefully and effectively worked out the Standard plans and drawings for an efficient factory organization. Here also all of the designs for the 3,600 engine parts going into each and every motor are worked out. Drawings of parts which are cast are sent to the pattern shop, where the workers build from the drawings the wood or metal patterns required by the foundry man. The latter transforms these into the rough castings of iron, steel, or bronze, which together with the forgings for other parts, are delivered to the tooling department. Then the machine men one after another take the rough parts and shape them. No operation, no matter how simple or elaborate, is avoided even when the first cost of a jig or special tool appears prohibitive. Even such costs are infinitesimal compared with the cost of the thousands upon thousands of pieces going into each machine.

Specialized effort is the keynote of the Standard shops. Each operation, whether it be the first cut from the raw stock, a drop forging, or a part which has to be rough turned, drilled, milled, heat-treated, case-hardened, filed, balanced or accurately fitted into its place, is done by separate hands, skilled in that particular operation. Even the machine shop work, forge, foundry, pattern and assembly work is taken care of by skilled men. A thorough record is kept, in which the brains and intelligence of the foremen and workmen are recorded by the shop management and division heads.

The Standard shops cover a city block, and have a floor space of over 110,000 square feet. Railroad switches run to the different points on the property, and the whole arrangement is laid out for saving of time and labor from the moment the raw material is received until the finished product is placed aboard the freight car.

The factory arrangement is such that the heavier castings and forgings do not leave the ground floor, but pass from one end of the building down to the far end several hundred feet away. The lighter parts in the rough are taken to the top floors, from which they gradually work down from one machine to another, until they are finally delivered to the erecting shop for assembly together into the motor. The most modern tools, electrically driven, regardless of first cost, are used. A single example may be taken from the highly developed grinding tools, which enable the operator to vary the size of the part he is working on by ¼ of 1/1,000 of an inch, or even less if desired, no matter whether the piece is of hardened steel or cast iron.

When a Standard motor is completely assembled, it is by no means considered finished. It is then taken to the test room where the engine is set up under the conditions resembling those in a boat. It is coupled with a dynamometer or water brake, and a full load put on the engine. It is started under its own power, and run and maneuvered for a considerable period, and given a thorough inspection. The circulating pump must deliver just the right amount of circulating water, the gasoline pump the correct amount of fuel, the lubricator the necessary amount of oil, etc. In testing the 1,100 motors built for the 550 submarine chasers over $7,000 worth of gasoline and lubricating oil was used each month.

The installation of the power equipment in the hull is another operation calling for highly specialized work. This work was so laid out that gangs of two or three men went right through from one hull to the next doing just one thing until every particular job in all of the 550 boats was completed. One gang simply set up shaft bearings. Another installed propeller shafts and propellers, another gang installed the water piping, another the air piping, still another the gasoline piping, etc. The lining up gang, without a minute's lost time started in lining up the engine as soon as the powerful crane which unloaded the motor from the freight car has lowered it to its foundation in the boat. When the last fitting was done, the boat was delivered to the testing out crew, who ran it over the trial course.

Of course, the real test did not come until the boats were in actual service in the English Channel and the North Sea, but the reports which have reached us have not contained the slightest complaint. The boats and crews have been ordered to sea for ten days at a time, cruising constantly under their own power, out of sight of land, and nothing but the highest praise has been received concerning the machinery. Even the raw recruits who have been assigned in charge of many of the power plants have been able to handle them with no trouble whatsoever, and the men say that the conditions met have been so severe that if they had not felt absolute confidence in their power plants, life would have been unbearable.

One corner of the assembly room in the Standard's factory at Jersey City, N. J.

As mentioned above, each motor is guaranteed to deliver not less than 220 h.p. at 400 r.p.m. In many cases the power ran nearer to 300 h.p. Three-bladed Columbian propellers were used on the entire lot. The propellers had a diameter of about 40 inches, and gave the boats a speed of 19 knots.

The motors were air starting and reversing, no reverse gears being used. Compressed air was used for starting, stopping, and reversing the motors, this air being fed into the cylinders through the employment of a camshaft, carrying sets of cams for running ahead and reversing. These different cams sympathetically work the air inlet valves, the gasoline exhaust valves and the ignitors automatically through a simple movement in a fore-and-aft direction of the camshaft.

The camshaft about which all of the different operations center runs along the side of the engine below the cylinders, and is worked from the engine crankshaft by a worm, pinion, and bevel gears. It is moved in a fore-and-aft direction by the camshaft hand control level. The air cams on this camshaft work an air valve in each engine cylinder similar to a regular engine inlet valve. Then, when air is allowed to pass from the compressed air tank to the valves it enters each cylinder at the proper point of the piston travel for either ahead or astern running.

The two separate sets of ignitor cams on the camshaft by moving the ignitor rod upward cause a break in the contact—and the consequent spark which passes across the gap—at the proper moment on both running ahead and running astern. Besides this, these cams automatically set the ignition for a late spark when the camshaft is shifted to a running astern position.

The two separate sets of exhaust valve cams open and close the exhaust valve at just the right degree of piston travel for both running ahead and running astern, so that by simply shifting the camshaft lever a few inches forward or aft this engine is instantly made to do what other engines can't do.

The compressed air which makes possible the instant and absolute control of the engine is supplied by an air compressor mounted on the after end of the engine. The compressor piston is worked directly off the engine crankshaft by an eccentric so that it is running while the main engine is running. Working in conjunction with the compressor inlet air valve is a small regulating valve which admits air from the pipe supplying the air tank so that when the pressure in this supply line rises to a certain point it lifts the inlet valve off its seat, automatically putting the pump out of action, and when the pressure in the supply line drops to the fixed point again the inlet valve is automatically closed, so putting the pump into action. In this way a fixed pressure in the air tank is automatically maintained.

Circulating water is supplied to the engine's different parts by a bronze slow-speed pump. It is a double-acting piston type pump with Standard type of valves driven by a geared reduction from the engine crankshaft. Circulating water is taken from the manifold pipe and delivered through the circulating pump to a manifold on the cylinder. This manifold delivers by the restriction of holes an equal quantity of water to all cylinders, cylinder heads, valves, air compressors, etc. The water which circulates through the cylinders is cooled within the manifold on which there is a back pressure valve. This regulates and shows on the pressure gauge the amount that goes through the cylinders.

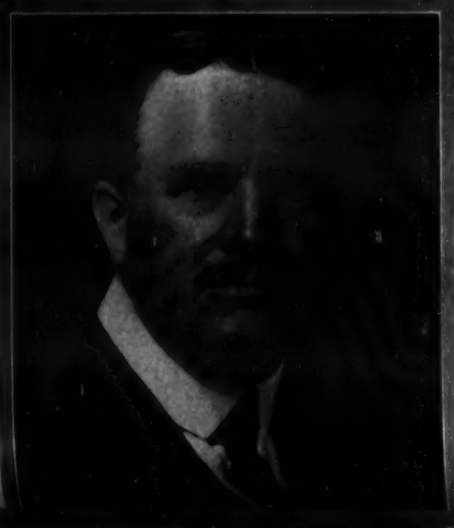
(*Continued on page* 54)

A number of the completed chasers in the basin at the Canadian plant, awaiting shipment to England

Men Who Have Developed Our Aerial Defenses

Group of Harvard students who learned to fly during the past year and who have volunteered their services. Lieut. Commander John H. Towers, head of the naval air service

Alan R. Hawley, president of the Aero Club of America and one of the pioneers of aeronautics



Henry Woodhouse, whose activities in the aeronautic field are known to all MoToR BoatinG readers

A YEAR ago this month, when the Mexican trouble brought out the fact that we had only twelve aviators and six aeroplanes with which to meet the emergency, Congress thought it was allowing a lot of money for aeronautics in giving an emergency fund of $500,000, and allowing a total of $3,000,000 for Army and Navy aeronautics. The sum was manifestly insufficient, and the Aero Club of America, the organization which has fathered the development of aeronautics in America since 1906, undertook a campaign of public education to get the public to ask for larger appropriations. This campaign consisted not only of sending hundreds of thousands of letters and upon as one of the most energetic men in the country, and received offers of all kinds, from directorship of large trusts to the undertaking of large contracts—all of which he declined on the ground that he had retired from business, and would give his entire time to the cause of aerial preparedness. Then he was spoken of for the proposed office of Secretary of Aeronautics, which he also promptly declined, and put himself on record as not wanting office of any kind.

When one takes up aeronautics, he is hopelessly gone for the rest of the world. Developments in aeronautics take place so fast, and the work to be done in the fathering of the science is so ex-

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Rear Admiral Bradley A. Fiske, retired, an authority on naval and defense problems

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pieces of literature to Congressmen, Senators, Governors of States, 3,500 newspapers, and thousands of influential people, but also included hundreds of addresses; practical flying demonstrations; exhibitions of aeroplanes; the formation of Aerial Coast Patrol units, and the training of military aviators.

Alan R. Hawley, the President of the Aero Club of America, who holds many long distance balloon records, made the first passenger flight ever taken from New York to Washington, to carry a petition to President Wilson, asking for 2,000 aviators. Rear Admiral Peary and Henry Woodhouse delivered hundreds of addresses on air power and the necessity of developing a powerful aerial coast patrol, and supplied hundreds of articles to the press on the same subject. They also supervised the arranging of "surprises," which resulted in placing four aeroplanes in succession on Government grounds in Washington with posters telling how many aeroplanes and aviators other countries had, and how few the United States had.

Mr. Hawley showed such a tremendous lot of energy in the campaign that he was soon looked

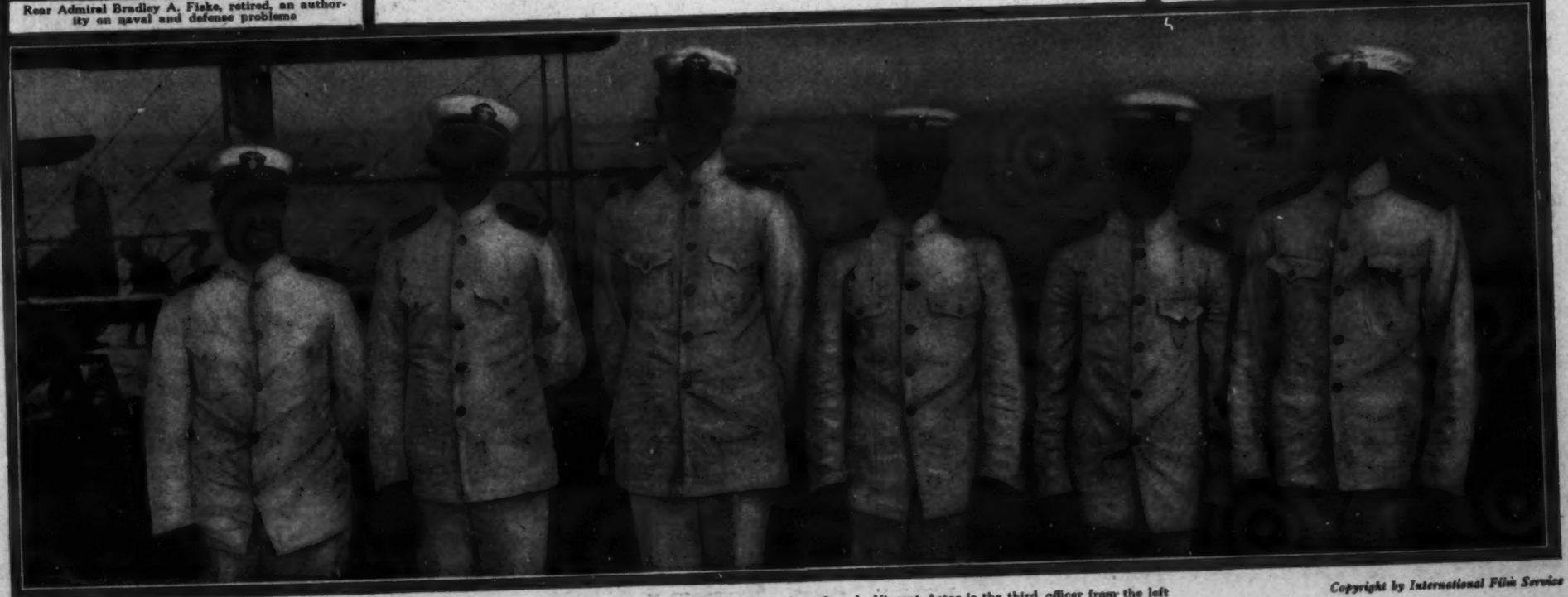
tensive, that a man has hardly time for anything else. So it is not surprising to hear Mrs. Peary say that, so far as she is concerned, Rear Admiral Peary, who is Chairman of the Aerial Coast Patrol Commission, might be discovering another Pole, so seldom is he at home. Like Mr. Hawley, Admiral Peary has been offered many offices and positions, and has declined them so that he might give all his time to bringing about the upbuilding of our aerial defenses.

Henry Woodhouse, who lives in aeronautics daily, from 7:30 A. M. to 1:00 A. M., has had charge of the educational campaigns of the Aero Club and of other organizations which are working for national preparedness. Like Mr. Hawley and Admiral Peary, he gives his time to the cause of aerial preparedness free of charge and makes substantial financial contributions besides.

There are a great many progressive men in the House of Representatives and in the Senate who appreciate matters of importance which are brought to their attention. The Aero Club workers found many of them willing to give their support in the

(*Continued on page* 51)

Congressman Hulburt, of New York, one of the leading advocates in flying in the legislative branch



The officers of the 1st and 2nd Battalions of the Naval Militia Aero Squad—Vincent Astor is the third officer from the left

Copyright by International Film Service

Taking the Trail

Painting by William H. Foster

MoToR BoatinG's Motor Patrol Series—No. 2 (See page 37)

Unrestricted Use of Motor Boats Approved

Navy Officials State That There Is No Intention of Curtailing in Any Way the Use of Motor Boats for Pleasure This Summer—President Wilson Gives Small Craft Special Rights

NO motor boatman need have the slightest hesitancy or fear about motor boating and cruising to his heart's content this summer. Even though President Wilson has issued an executive order establishing defensive areas at the principal ports, over which areas certain types of boats are forbidden to pass without permission, yet he has made a special case of small craft, leaving the autnority for the direction of their activities in the hands of local officials, granting them the power to govern as local conditions warrant.

Section VII of the President's order reads:

"All matters pertaining to fishery and the passage of small craft within a defensive sea area shall be regulated by the Senior Officer of the Harbor Entrance Patrol."

This practically means that the motor boat will not be bound by the other provisions of the executive order, which necessarily are quite strict and mandatory. As a result, there will be no cessation of motor boating activities during the coming season—within reasonable limits, of course.

Most of the associations governing motor boat racing and other activities afloat have decided to carry out their usual schedules as far as possible, unless some unforeseen events happen. The American Power Boat Association, the controlling body in national motor boat racing, is now granting sanctions for the principal races throughout the country. Dates have already been set for such well-known fixtures as the annual race of the New York Athletic Club to Block Island (June 23), and the New York to Albany and return race (June 30). The Mississippi Valley Power Boat Association will hold its annual three days' regatta at Minneapolis on July 2, 3 and 4. The Thousand Islands Yacht Club will hold the races for the Thousand Islands Yacht Club Challenge Cup for the hydroplane championship of the St. Lawrence River, at Alexandria Bay on August 8, 9 and 10. The races for the American Power Boat Association's Gold Challenge Cup, representing the championship of North America, will be held at Minneapolis, Minn., August 28, 29 and 30.

The schedules of events in other boating organizations, including the varjous yacht and motor boat clubs, show as much activity in other lines as in racing. The United States Power Squadrons have received new impetus under the state of war which now exists, and men are being enrolled and instructed by this organization in greater numbers than ever before. The squadrons have already been instrumental in enrolling over a thousand men in the Naval Coast Defense Reserve, and have taken it upon themselves to give the inexperienced reservists practical instruction in boat handling and coastwise navigation aboard the motor boats of their members.

Motor boating differs from all other sports in that it has a direct practical application to the defensive needs of our country. Besides being recreational in character it tends to train the minds and bodies of those who follow motor boating along the lines in which they would be of the greatest value to the nation. Without the motor boat and the motor boatman there could be no Naval Coast Defense Reserve, and without the Reserve there would be no submarine chasers or mosquito fleet. With the Reserve,

Commodore Vanderbilt's billion-dollar crew assigned to duty with him on S. P. 56

Photograph by Stebbins

S. P. 56, the 72-foot patrol boat owned by Harold S. Vanderbilt, rear commodore of the New York Yacht Club and turned over to the Government for use in the Naval Coast Defense Reserve. This boat has just been powered with a pair of eight-cylinder 300-400 h.p. 6¾ x 7¾-inch Duesenberg motors, and the trial trip, made under most adverse conditions, showed them well suited for the service

MoToR BoatinG's Motor Patrol Series—No. 2 (See page 37)

which now numbers many thousands of quick-witted, enthusiastic motor boatmen, we shall be able to protect not only our own shores, but perhaps the traffic lanes of the European war waters.

It is with the needs of the Naval Coast Defense Reserve in mind that the national organizations, clubs, as well as the many thousands of individual motor boatmen, should prepare for an active season on the water. No man who takes intelligent interest in small-boat seamanship need fear that he is indulging his love of the sport at the expense of being thought a slacker.

In some parts of the country rumors have gained ground that motor boats would not be allowed to navigate the Federal waters of our country this summer, or that should they be allowed to, their use would be attended with great danger to those aboard, as well as with generally adverse conditions. There is absolutely no reason for such a rumor. Naval officers who will be in charge of patrolling the defensive sea areas defined by President Wilson have not hesitated in stating that as far as they are able to determine at the present moment there will be no restriction on the use of motor boats for pleasure purposes. In some instances it has been suggested by naval officers that it might be well to arrange some plan whereby the motor boatmen or their boats would be licensed. However, the granting of such a license would be merely a perfunctory operation, and simply a permit to navigate the waters. It will be granted upon application, and there will be no license fee, its purpose being solely one of identification.

Inasmuch as President Wilson in his executive order has given special rights to the small craft, and authority to the officers of the various naval districts to draw up regulations governing the use of motor boats, we recently wrote to the various naval districts asking the commandants to inform us of their plans for regulating motor boating in their waters during this coming summer. We give below the replies from the various commandants, which may be taken as official and final:

First Naval District

1. As far as is contemplated at the present time, there is no intention of placing any restrictions on pleasure motor boating in the First Naval District.

2. All boats, however, of whatever nature, desiring to navigate the waters of the First Naval District, are being licensed—this license is merely a permit to navigate the waters of the First Naval District. There is no license fee and the purpose is merely one of identification.

3. There is forwarded, for your information, a copy of a blank application for license. In the direction printed thereon it will be noticed that "boats must carry their license numbers prominently displayed on both sides of the boat." **The feature of carrying license numbers permanently displayed has just been abolished, by orders from the Navy Department.**

4. As to whether or not the Federal Government will place any restrictions upon motor boating or other pleasure craft is not known. The Navy Department only can answer that question. The licensing of water craft in all Districts is, I believe, contemplated, similar to that now being done in the First Naval District.

(Signed) R. DELE HASBROUCK,
Captain of the Port,
Commanding Boston Section.

Third Naval District

The movements of motor boats and such craft are interfered with as little as possible, but they should avoid defensive sea areas except when it becomes necessary to cross them, which should be done in the daytime. When they approach such areas the regulations and the instructions of the patrol officer must be carried out, and all are required to be positively identified before crossing.

(Signed) L. R. DE STEIGER,
Captain, U. S. N.,
Chief of Staff.

Fourth Naval District

At the present time no plans have been made for restricting the use of motor boats during the coming season, except that they will not be allowed to move in the inland waters after dark.

There is no intention, on the part of this office, of curtailing in any way the use of motor boats for pleasure. However, events may transpire which will necessitate curtailing in some way the movements of these vessels. This contingency is not foreseen at the present time.

(Signed) GEORGE F. COOPER, Captain, U. S. N., Commandant, Fourth Naval District.

Fifth Naval District

It is impossible to give you information as to what will take place in the future when the duration and extent of the war are so far unknown. I enclose for your information a pamphlet defining certain "Defensive Sea Areas." Some of these have been placed in force. Most of them have not.

When a regulation of this kind is placed in force, ample notice is given, Hydrographic bulletins are issued and notices are published in all the newspapers; what to do, how to do, and when to do it is all exactly laid down. Whether it is simple or easy of enforcement, etc., must be judged by the individual affected by it, but as the regulations are, so they are.

There is no restriction so far, that I know of, which prevents motor boats from passing through any "Defensive Sea Area" in the daytime after being duly recognized and given permission to proceed. There is nothing so far as I know which will prevent considerable freedom of movement; certainly in all inland waters and bays; nor on the ocean provided they wish to run the risk, and are not themselves mistaken by our men-of-war as possible enemy vessels.

There are no plans to work out that I know of with regard to the freedom of passage of motor boats. All vessels, large and small, are subject to the same rules affecting "Defensive Sea Areas." It is possible that later, if the conditions become more stringent, other and more strict rules may be made to apply, but what they might be I could not prophesy.

In a general way, of course, I agree with you that it would generally be unnecessary to restrict pleasure boating. There will be, how-

(*Continued on page 52*)

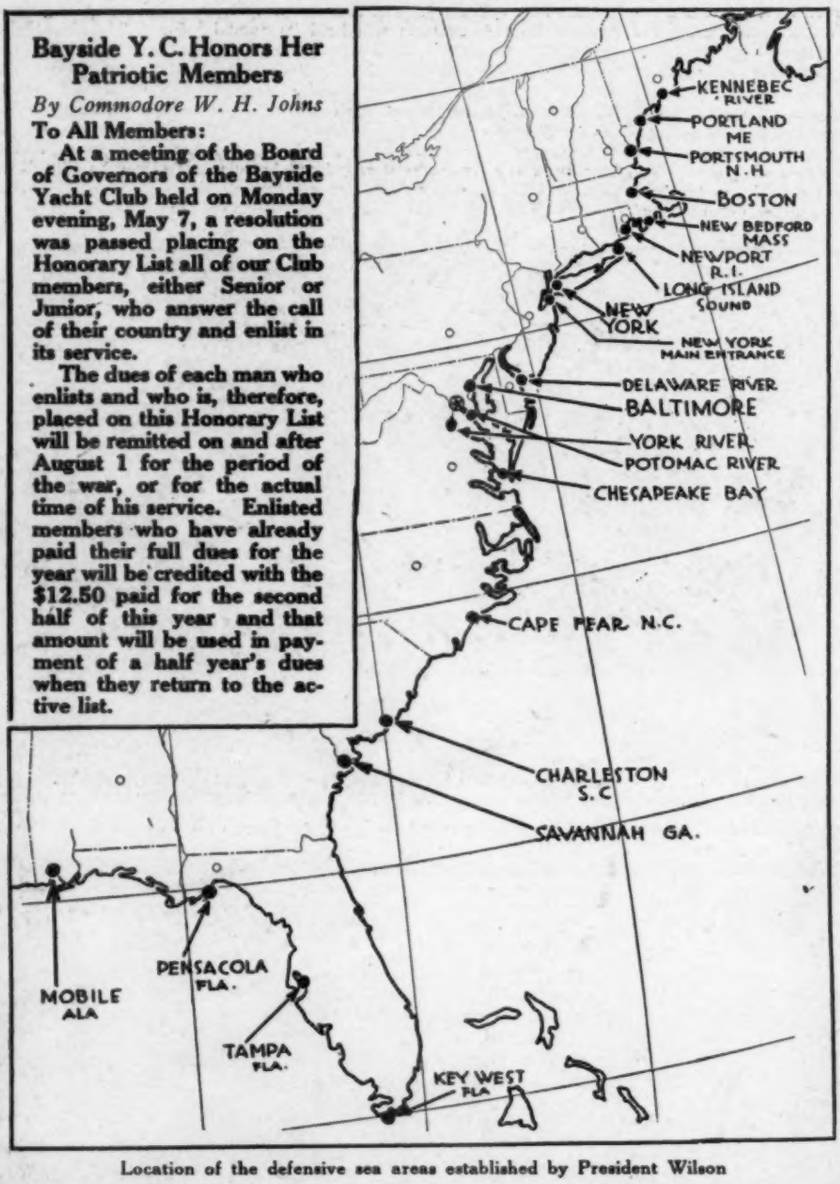
Bayside Y. C. Honors Her Patriotic Members

By Commodore W. H. Johns

To All Members:

At a meeting of the Board of Governors of the Bayside Yacht Club held on Monday evening, May 7, a resolution was passed placing on the Honorary List all of our Club members, either Senior or Junior, who answer the call of their country and enlist in its service.

The dues of each man who enlists and who is, therefore, placed on this Honorary List will be remitted on and after August 1 for the period of the war, or for the actual time of his service. Enlisted members who have already paid their full dues for the year will be credited with the $12.50 paid for the second half of this year and that amount will be used in payment of a half year's dues when they return to the active list.



Location of the defensive sea areas established by President Wilson

Naval Rank and Corps Devices

A Complex Subject of Particularly Timely Interest—Insignia Prescribed for the Sleeves of Commissioned and Petty Officers, and the Collar Devices of Warrant Officers and Others

PART I

A STUDY of the uniforms and insignia worn by officers and men in the Navy becomes a matter of unusual interest at this time, and should, moreover, be carefully undertaken by all motor boatmen in advance of their enrolment in the Naval Coast Defense Reserve. After enrolment they will have many other things with which to occupy their minds, and may well feel themselves blessed if they know the difference between an admiral and a chief boatswain's mate the first time they see either of them. There is small use in denying that the subject is a most complex one, compared with which learning the Morse or the semaphore code is like falling through an open hatchway. Not only are there several uniforms, each of which has its particular use, but one must also learn the devices which designate the different corps, and the marks of rank, while all these differ according to the position in which they are worn, and in conformity with service and dress uniforms. When you say that there are hat and cap markings, epaulet and shoulder strap insignia, collar devices for dress and service uniforms, and insignia of rank and chevrons worn on the sleeve, you only touch the surface of the subject and give a faint idea of its complexity. After you get well into the subject you wonder how any officer of the Navy, with his brain burdened by all this information, has room left to figure the distance of an enemy submarine and hit it with one shot of a six-inch gun. But it's being done these days.

Boatswain's mate, first class

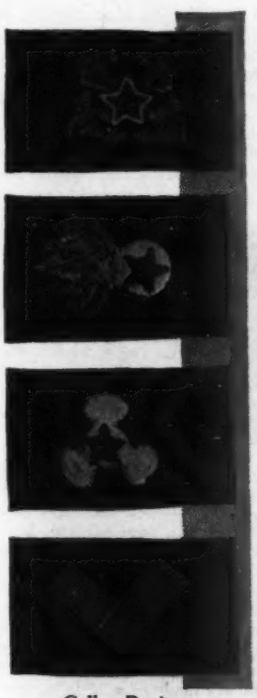
Gunner's mate, second class

These rating badges, consisting of a spread eagle above a specialty mark and a class chevron, are worn by petty officers of the United States Navy. For blue clothing they are made of scarlet cloth, and for white clothing of blue cloth. They are worn on the right sleeve by petty officers of the seaman branch and on the left by all other P.O's.—Top picture: chief master-at-arms; bottom: quartermaster, third class

Taking up the devices and insignia in the order in which they appear on these pages, we find in the largest illustration four rating badges worn by different petty officers of the Navy. The rating badge consists of a spread eagle above a specialty mark and the class chevron. Chief petty officers wear a chevron of three stripes with the uppermost stripe arched to form the arc of a circle, within the field of which is the specialty mark. As shown in the upper illustration this specialty mark is the star of a master-at-arms, and the chevron shows the wearer to be a chief master-at-arms. At the left in the same group is the specialty mark of a boatswain (two crossed anchors), and the three stripes denote the rank to be boatswain's mate, first class. The two stripes on the badge at the right show the wearer to be a petty officer, second class, and the two crossed guns reveal him as a gunner; the rating badge is, therefore, that of a gunner's mate, second class. The lower badge is worn by a third class petty officer (one stripe) who is in this case a quartermaster, as is indicated by his specialty mark.

The devices worn on both sides of the collar on the service coats of chief warrant officers, warrant officers, mates, and paymaster's clerks are also shown on this page, while those worn by commissioned officers from the rank of ensign up will be taken up in a later issue of this magazine. Fig. 1 is the collar device of a chief boatswain, and consists of two foul anchors crossed, embroidered in silver, surcharged at the point of crossing with a gold five-pointed star, one ray of which points midway between the stocks of the anchors and directly toward the neck edge of the collar. Fig. 2 is the mark of a chief gunner, consisting of a flaming sperical shell surcharged in silver with a gold star, which has one ray pointing directly away from the flame and parallel to the neck of the collar. Fig. 3: chief machinist — a three-bladed propeller, embroidered in silver, surcharged in the center with a gold star, one ray of which points along the axis of one blade of the propeller and toward the neck edge of the collar. In each of the above devices the star measures 5/8-inch in diameter.

While these three collar devices are worn by chief warrant officers



Collar Devices

Fig. 1. Chief boatswain — two silver foul anchors crossed, surcharged with gold five-pointed star, one ray pointing directly upward.

Fig. 2. Chief gunner — flaming spherical shell in silver, surcharged at center of shell with gold star, having one ray pointing directly away from the flame.

Fig. 3. Chief machinist — three-bladed propeller in silver, with gold star in center, one ray of which points along the axis of one blade and directly upward.

(Boatswain, gunner, and machinist wear corresponding insignia, but the devices are in gold with silver stars.)

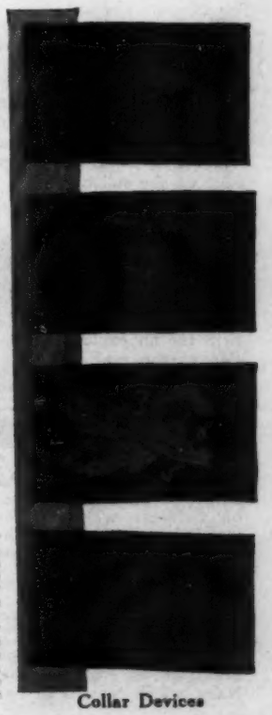
Fig. 4. Chief carpenter and carpenter — carpenter's square, point down, embroidered in silver or in gold, respectively.

Fig. 5. Chief sailmaker and sailmaker — diamond embroidered in silver or gold respectively, with the long axis horizontal, paralleling the neck edge of the collar.

Fig. 6. Chief pharmacist and pharmacist — caduceus, embroidered in silver or in gold respectively, with the horizontal axis parallel to the front edge of the collar.

Fig. 7. Paymaster's clerk — pay corps device, embroidered in gold, the stem of the leaf pointing toward the front of the collar, parallel to the neck edge.

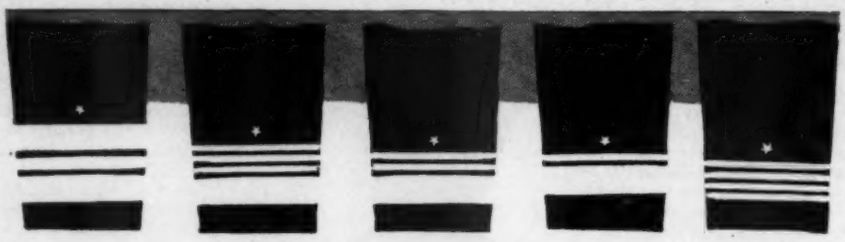
Fig. 8. Mates — binocular glass, embroidered in gold with less than twenty years' service as mate, or in silver after twenty years' service as mate, with top and bottom parallel to the neck edge of the collar.



Collar Devices

of the line—chief boatswain, chief gunner, and chief machinist—it is interesting to note that the devices of the warrant officers who are their immediate subordinates, are identical except that the star is surcharged in silver over gold embroidery. (In this connection also it may be noted that wherever a distinction in seniority is made by gold or silver devices, silver is used to mark senior rank, and not junior, as might be expected. The distinguishing device of a commander, for instance, is a silver oak leaf, while that of a lieutenant-commander is a gold oak leaf.)

The next three figures (Figs. 4-6) are the collar devices worn by chief warrant officers and warrant officers of the staff, and as above, the embroidery is in silver for the senior rank and in gold for the junior. Fig. 4, a carpenter's square, point down, is the collar device of chief carpenters and carpenters; Fig. 5, a diamond with the long axis parallel to the edge of the collar is that of chief sailmakers and sailmakers; and Fig. 6, a caduceus, the corps device worn by chief pharmacists and pharmacists. Chief warrant officers retired with the rank of lieutenant, junior grade, wear the same devices, respectively, as above, with the addition of a silver bar.



Insignia of rank worn on the sleeves of commissioned officers of the Navy.—From left to right: Admiral of the Navy, two two-inch stripes of gold lace separated by a one-inch stripe; admiral, one two-inch stripe and three half-inch stripes above it; vice-admiral, one two-inch and two half-inch stripes; rear admiral, one two-inch and one half-inch stripe; and captain, four half-inch stripes. The grades of admiral and vice-admiral are non-existent in the United States Navy

Fig. 7 shows the pay corps device—a silver oak sprig of three leaves and three acorns, with the stem pointing toward the front of the collar—which is worn by paymaster's clerks. Fig. 8: mates—a binocular glass, embroidered in gold with less than twenty years' service as mate, or in silver after twenty years, with the top and the bottom parallel to the neck edge of the collar.

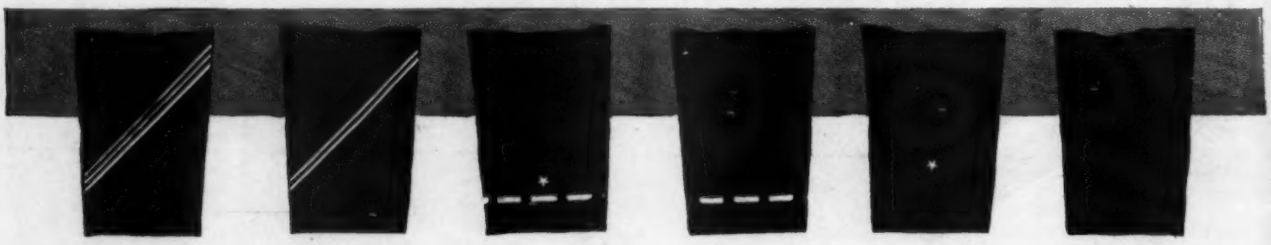
Specialty and distinguishing marks as well as metal corps devices will be taken up separately in a subsequent issue, giving room in this article for an explanation of the rank insignia worn on the sleeves of commissioned officers. These, as worn on frock and service coats and overcoats, consist of stripes of gold lace of different widths, placed a quarter of an inch apart. In every case the lowest stripe is set two inches from and parallel to the edge of the sleeve.

At the left of the top panel is shown the distinguishing mark of the Admiral of the Navy, which consists of two two-inch stripes with one one-inch stripe between. Next to it is the admiral's insignia (should Congress at any time revive the grade), which consists of one two-inch stripe and three half-inch stripes above it. The middle illustration portrays the insignia of a vice-admiral (should Congress revive the grade), consisting of one two-inch stripe and two of half-inch width. One two-inch and one half-inch stripe of lace denotes a rank of rear admiral, and four half-inch stripes that of captain.

In the bottom panel, respectively, are: commander, three half-inch stripes; lieutenant-commander, two half-inch with one quarter-inch stripe set between them; lieutenant, two half-inch stripes; lieutenant, junior grade, one half-inch and one quarter-inch stripe, and ensign, one half-inch stripe.

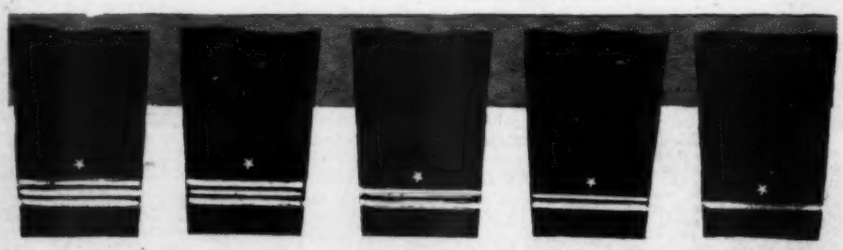
When used, the star, which is of gold, five-pointed, is an indication that the officer wearing it is of the line; staff officers wear the same stripes as those prescribed for line officers. The corps to which the latter belong are indicated by bands of different colored cloth, filling the intervals between the stripes of gold lace. These are as follows: For medical officers, dark maroon velvet; for pay officers, white cloth; professors of mathematics, olive green cloth; naval constructors, dark violet cloth; civil engineers, light blue cloth; medical reserve officers, crimson cloth, and dental officers, orange-colored velvet. Where only one stripe of lace is worn the colored cloth shows a quarter of an inch above and below the stripe.

In addition to the specialty and distinguishing marks, which will be described in a later issue, enlisted men in the Navy wear branch marks and service stripes on their sleeves. The branch mark is a strip of braid three-eighths of an inch wide worn on the overshirt and jumpers of all enlisted men (except chief petty officers) for whom the overshirt is prescribed, placed on the shoulder seam of the sleeve and extending entirely around the arm. This mark is worn on the right arm by men in the seaman branch,



For midshipmen of first and second class three and two diagonal sleeve stripes, respectively, are prescribed. Chief warrant officers wear a half-inch stripe similar to that prescribed for ensigns (see below) except that it is broken into two-inch lengths by blue silk thread in half-inch widths. Pay clerks, and staff warrant officers (carpenter, sailmaker, and pharmacist) have plain sleeves, but mates, and the warrant officers of the line (boatswain, gunner, and machinist) are entitled to the star, the use and description of which will be found in the caption below

Three diagonal stripes indicate the rank of midshipman, first class, and two similar stripes midshipman, second class. Chief warrant officers of the line (chiefs boatswain, gunner and machinist) wear a half-inch stripe broken at two-inch intervals by blue thread for half-inch widths, with a star above; and the corresponding rank in the staff (chiefs carpenter, sailmaker, and pharmacist) is indicated by an identical stripe without the star. Boatswains, gunners, machinists, and mates display only the star, and there is no marking on the sleeves of carpenters, sailmakers, pharmacists, and pay clerks.



All line officers wear above their rank-designating stripes a gold five-pointed star with one ray pointing directly downward. Staff officers wear stripes identical with those prescribed for line officers of corresponding rank, but omit the star.—From left to right: commander, three half-inch stripes; lieutenant-commander, two half-inch stripes separated by a quarter-inch stripe; lieutenant, two half-inch stripes; lieutenant, junior grade, one half-inch and one quarter-inch stripe; and ensign, one half-inch stripe

and the braid is white on blue clothing and blue on white clothing. Men in the artificer branch and the engine-room force wear the mark on the left arm and can further be distinguished from seamen by reason of the braid being red on both blue and white clothing. Shipwrights, musicians, buglers, hospital apprentices, and commissary and messmen branches wear no branch mark. In the days of the old Navy the braid worn on the right or left shoulder indicated the watch to which the wearer belonged.

Service stripes are worn by all re-enlisted men on the left sleeve on blue and white coats, overshirts, and jumpers. These stripes are made of scarlet cloth for blue clothes and of blue cloth for white clothes, and they are eight inches long, stitched diagonally across the outside of the forearm at an angle of forty-five degrees. For each completed term of enlistment men are permitted to wear one stripe, and for permanent petty officers holding three consecutive good-conduct badges, the service stripes on blue clothing are made of gold lace.

MY IDEAL CRUISER

The 30-Foot Flashlight

The Fifth of MoToR BoatinG's Fleet of Ideal Cruisers Is a Tight Little Craft Which Can be Successfully Constructed by Two Men

By C. E. Bradley

IT matters not how much experience we have gained with our earlier boats or to just what extent our ideas and fancies run; when it comes to the planning of our Ideal Cruiser, most of us in the end will have to make it a little ship that will jibe with the bank statement. Yet, when the boat finally becomes a reality, we are just as enthusiastic and just as fond and proud of her as we can be, even though she isn't quite as elaborate as our visions first pictured her. She is just as serviceable, and that in the long run is what we are after, anyway.

My counsel to those who think they would like to cruise is by all means "go to it"—get started. Plan your boat with a level head and take action, but don't spend all your time in idle planning. It may be good fun and all that to plan, but it's certainly not to be compared with the sport of cruising, and the boat can easily be planned beyond the limit. There's many a good fellow who after spending countless pleasant hours in doping out his ideal has finally given up the whole project simply because fancies and beliefs led him beyond the boat of his means.

THE final date for the consideration of designs for My Ideal Cruiser series is now past, and we find ourselves supplied with the plans and descriptions of a number of extremely interesting boats. Such of these as are suitable will be published in succeeding months, and at the conclusion of the series a prize of $100 worth of equipment will be awarded to the amateur designer whose craft, in the opinion of our readers, most nearly approaches the ideal.

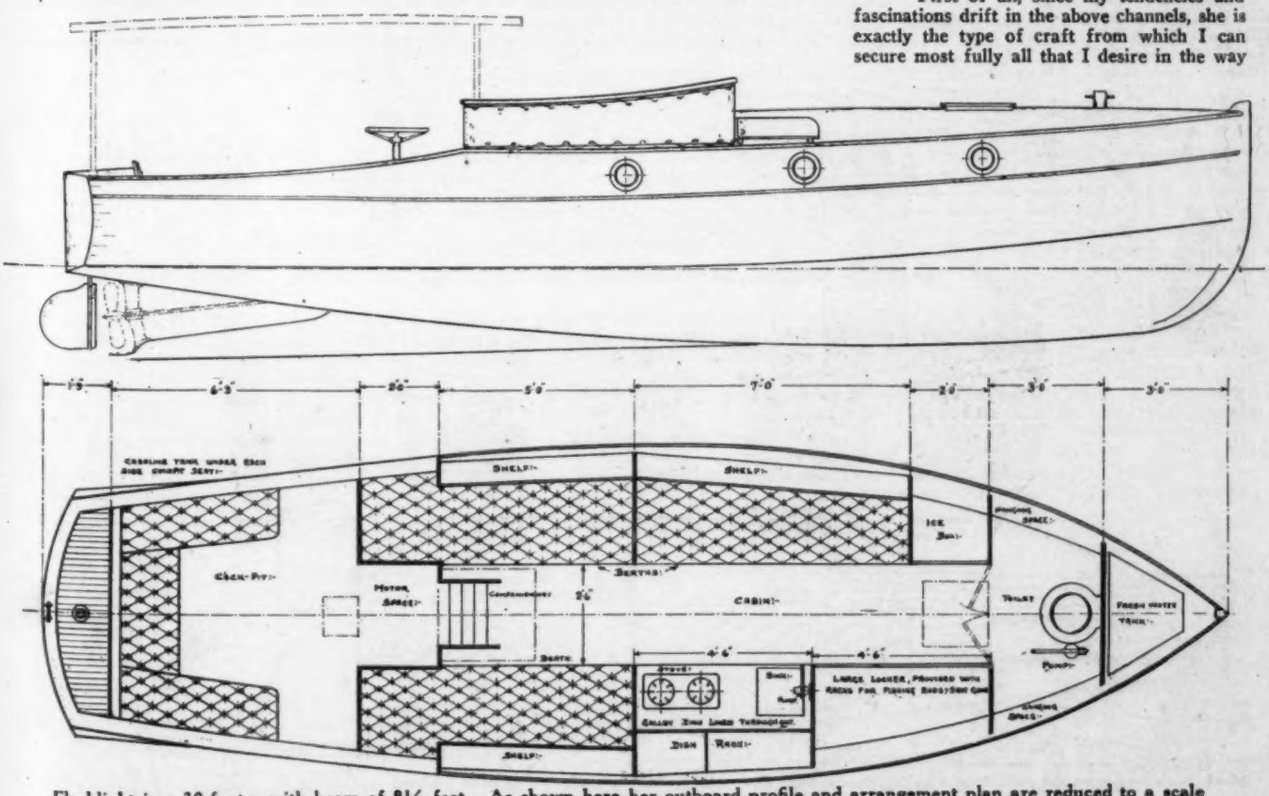
In presenting these Ideal Cruisers we ourselves shall not attempt to say which is the best, any more than we would tell a dog owner that the dog belonging to another friend of ours was superior to his in beauty, intelligence or anything else—even in laziness or general cussedness. These are cases in which silence is not only golden, but tinged with platinum, for the owner of a boat or a dog fondly believes that the bad points of his possession are just a little better than the good points of another's. We think, however, that in Sunray and Spook (both 36-footers), White Cap (26 feet), Ruth (38½ feet), and now Flashlight (30 feet), we are offering to the readers of MoToR BoatinG some pretty fine specimens of amateur craftmanship—and the qualifying word amateur isn't altogether necessary.

Flashlight enters the fleet as the first V-bottom model of the series. Thirty feet overall, she is beamy for her length (8½ feet), but with the proper power plant she will maintain a cruising speed equal to that of her predecessors. Sleeping accommodations have been laid out for three persons, and her galley and toilet arrangements are complete in every detail. She merits distinction as a boat which can be built by amateurs without great trouble or expense.—Editor.

For the average fellow who puts in from five and a half to six days out of each seven over a desk in the office or within the shops, the ideal cruiser must positively be of inexpensive initial cost and with an upkeep in comparative relationship. Many a prospective builder even further requires her to be of such a design that he himself can successfully build with the aid of his crony and perhaps an occasional lift from the "mate." She must be a boat which when finished is perfectly suitable for week-end or holiday trips and vacation use—those good times to which we all look forward so anxiously from week to week.

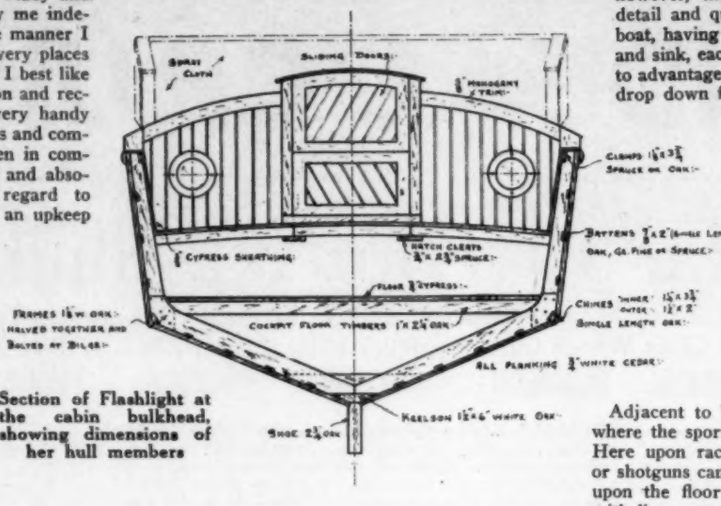
Most fellows like to fish or hunt during the various seasons. Others derive profound enjoyment in mere exploration on a strongly constructed, seaworthy and fairly speedy craft. For all just such good chaps and requirements as these (and with all the foregoing in mind), the little cruiser Flashlight was created and intended.

Just why she is my ideal cruiser I can set forth in the following reasons: First of all, since my tendencies and fascinations drift in the above channels, she is exactly the type of craft from which I can secure most fully all that I desire in the way



Flashlight is a 30-footer with beam of 8½ feet. As shown here her outboard profile and arrangement plan are reduced to a scale of ¼-inch to the foot

of sport. Such a boat stands ready and willing at all times to convey me independently and not only in the manner I best like to travel, but to the very places and surroundings amid which I best like to spend my hours of diversion and recreation. Then, too, she is very handy in every respect, with all things and component parts get-atable. When in commission she is easily handled and absolutely a one-man boat in regard to operation and control. With an upkeep that is trivial, she is just the type to tinker and putter about with oneself while afloat, and not of the type to be easily forgotten or slighted during the off season while out of commission.



Section of Flashlight at the cabin bulkhead, showing dimensions of her hull members

She is a small boat, 30 feet in overall length, by 8 feet 6 inches beam and moderate draft, with allowable headroom for the type and dimensions—in brief, a little craft aboard which a fellow (in company with the better half and youngsters or along with a couple of seasoned bachelors), can take an endless amount of pleasure whenever opportunity affords. The accommodations are ample for three grownups, and provision can easily be made for a fourth or for a couple of children.

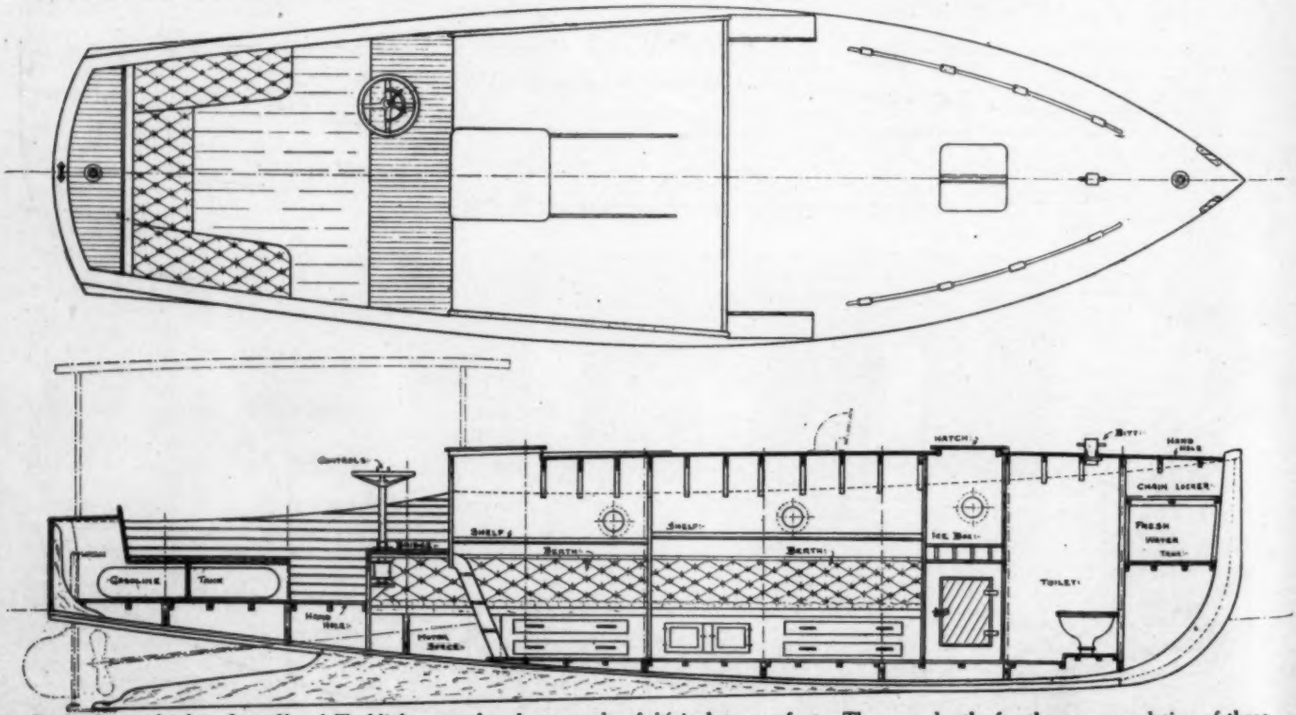
And now let us take a peep below decks. Upon entering the companionway one finds himself within a cabin unusually roomy and convenient. First of all housed neatly under the companionway steps or ladder is the motor, the controls of which are led to the steering wheel. In order that she shall rightfully acquire and maintain the position of success and prominence we have already and thus far attributed unto her, the power plant together with its accessories must also be quite ideal. Practically any moderate priced medium-duty, four-cycle machine of, say, 24-36 h.p., with its complete equipment, will fill the bill and give you all you wish. At any rate, don't let a misfit motor and equipment mar your cruising delights. Give due consideration to this indispensable and important item. Consult with those profoundly experienced and heed only the advice of those upon whom you can positively rely before placing an order.

Adjoining the motor space, one on each side, and directly opposite each other, are two berths. It is to be noticed that the foot end in each case extends well under the bridge deck. By such arrangement quite an amount of space can be gained for the cabin proper even without confining the transom to a limited amount of leg room. Next, on the port side is a third berth similar in other respects to the first two mentioned. In all cases lockers or drawers underneath provide storage space, while the third transom can also be fitted with a sliding extension berth for extra accommodations.

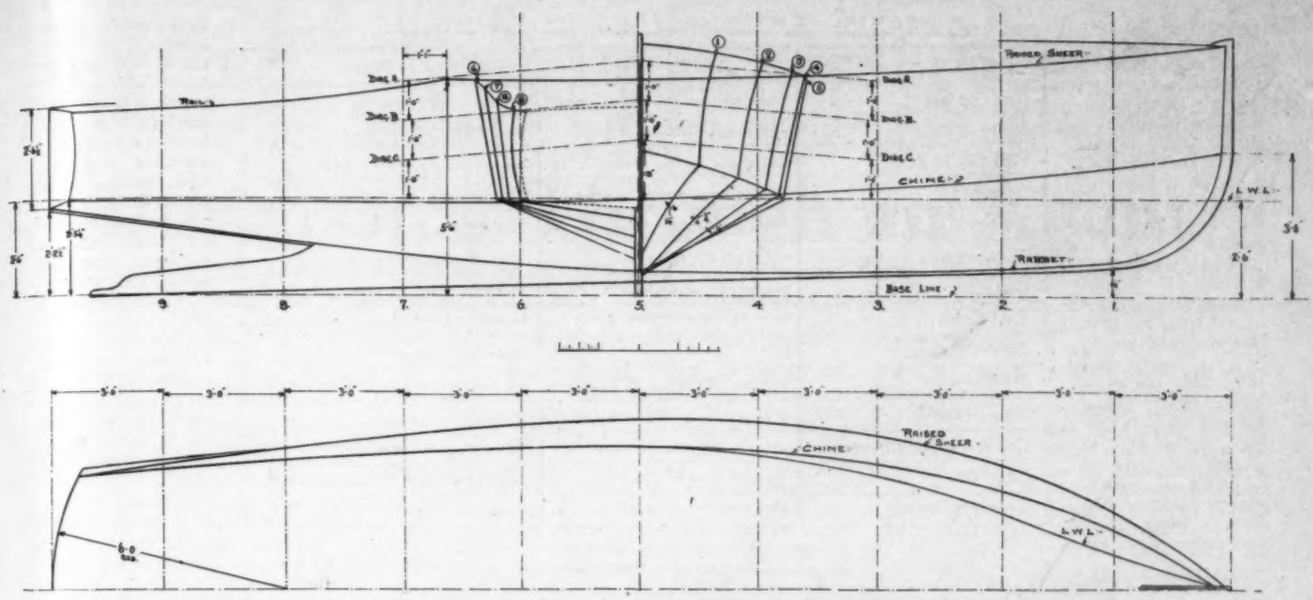
Opposite berth three and on the starboard side is the galley. Everything about this portion of the ship should be readily accessible, for if there is one feature above others concerning an ideal cruiser that really demands unstinted attention, it is the galley. Most of us men folks do little more than hate the bother of cooking, to say nothing of the malignity borne for the gentle process of cleaning up. It takes only a few short cruises in a boat equipped with a makeshift galley to set the fellows to taking their meals on shore. Here, however, the galley is complete in every detail and quite well found for so small a boat, having dish rack shelves, stove stand, and sink, each and all worked in and placed to advantage. Hinged covers, fitted so as to drop down flat over both the sink and the stove when either is not in use, form table tops which are very handy. A food locker and storage space with shelves for pots and pans, etc., is to be built in beneath the stove stand and sink respectively and of course the sink is to drain outboard. Table tops and walls above and about the sink are to be lined with thin sheet zinc.

Adjacent to the galley is a spacious locker where the sporting equipment is to be stored. Here upon racks or shelves the fishing rods or shotguns can be kept neatly arranged, while upon the floor the bait buckets and baskets with lines, etc., can be placed in orderly fashion so as to be available if wanted quickly. When stocked complete and arranged to suit, this locker will in all probability be a distinguished feature of your boat, and one you'll take considerable pride in calling to the guests' attention from time to time. Facing the forward end of the locker is the refrigerator, and no honest-to-goodness cruiser should ever put forth without this most desirable addition. Ice can be taken on without difficulty or great delay at almost any of the stations you will encounter. Its cost and trouble of obtaining is easily offset by its prolonging for later use such food as meat and fish. Here also the fresh water delivery pipe runs into a coil within the space or compartment wherein the ice is kept. Thus, with ice in the box a continuous supply of cool drinking water is at hand no matter how warm the day may be above the deck. An arrangement similar to that employed at the galley sink should be here installed, thus allowing the water from the melting ice to drain outboard.

At the end of the aisle extending across the forward part of the boat is the toilet room. Fitted with swinging doors, this room is separated from the rest of the craft, while the



Deck plan and inboard profile of Flashlight reproduced at a scale of ¼-inch to one foot. There are berths for the accommodation of three or possibly four persons



Lines of Flashlight at a ¼-inch to one foot reduction. This is the first V-bottom in MoToR BoatinG's Ideal Cruiser fleet

walls, provided with numerous hooks, afford good hanging space for clothing and oil skins.

The fresh water tank is securely placed in the forepeak at such a height as to just allow the water to flow by gravity to the sink. If, however, the capacity of the tank is of maximum proportions, it will necessarily have to be placed somewhat lower and a pump must be installed at the sink.

Care has been taken to give Flashlight plenty of light and ventilation. The removable hatch forward, together with the hood ventilator, companionway and port-lights, will keep the cabin free from odors or closeness at all times.

A first class electric lighting plant is also part of the equipment, with connections leading not only to the most convenient points within the cabin, but to the running lights as well.

Above the deck a canvas shield or dodger cloth is neatly stretched along a hardwood frame work. This extends well along the sides and forward of the companionway slide. Adding to the appearance of the boat and at the same time being a serviceable feature, the dodger cloth affords protection from spray or wind to all articles left on the deck during a breeze.

The deck itself is canvas covered with a good grade of duck tightly stretched and well set in thick paint. Deck covering boards should not be over wide, for if the boards should shrink as time elapses, the seams which open are quite liable to cause noticeable and unsightly ridges. Then, too, wide boards are also likely to warp or curl if not well fastened—especially at the extreme edges—and should this occur, the ridge semblance is much the same only in some instances perhaps even worse in appearance. A stout signal mast made so as to unship readily can also be fastened to the deck in a secure manner, providing means not only for the proper display of signal flags, but also for the carrying of an emergency sail rig.

The gasoline tanks are securely lashed under the cockpit seats and should be of ample capacity to meet the requirements of a prolonged cruise. Two tanks, one on either side and each of about thirty gallons' capacity, are quite sufficient for any lengthy week-end cruise or a number of continued short runs without having to worry over replenishing with perhaps low grade fuel at high grade prices at every other little port you chance to make.

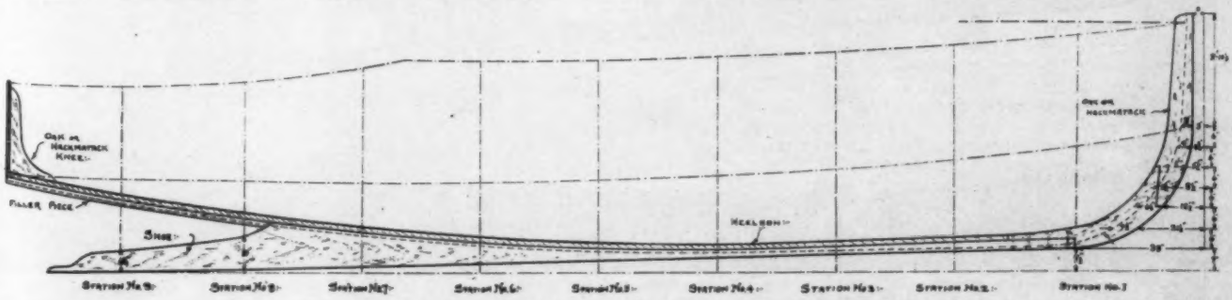
A simple awning, fitted with curtains having windows or panels of transparent material such as celluloid, can be erected over the cockpit if desired, thereby keeping out sun or weather while under way.

The materials entering into the actual construction of the hull of course differ in no way from those as ordinarily employed and found in the best built boats. Particulars of the various pieces to be used can be readily obtained from the list of materials as shown on the plans. In all cases the pieces should be of selected stock, the best of quality in its particular kind. Special attention should be given to the selection of the seam battens or stringers, which are to be in simple strips running full length of the boat. The planking also should be from the longest lengths obtainable. The boards should be dressed at the mill to a uniform thickness; for upon the finish of the planking depends greatly the outward ap-

TABLE OF OFF-SETS AND HEIGHTS:-

STATIONS	HALF BREADTHS:-						HEIGHTS:-			
	SHEER	CHINE	RABBET	DIAG. A.	DIAG. B.	DIAG. C.	SHEER	CHINE	RABBET.	KEEL:-
1	1-11-4	1-6-0	0-1-3	1-10-4.	1-8-0	1-6-6.	6-1-0.	3-3-0.	0-9-4.	0-7-4.
2	3-1-7	2-6-1.	"	3-1-0.	2-9-7.	2-7-5.	5-9-5.	2-11-4.	0-8-4.	
3	3-10-6.	3-2-2.	"	3-10-5.	3-7-4	3-4-7.	5-7-7.	2-9-0.	0-7-2	
4	4-3-0.	3-6-0.	"	—	—	—	5-6-4.	2-6-7	0-7-2.	
5	4-3-6.	3-7-4.	"	—	—	—	5-5-4.	2-5-4.	0-7-4.	
6	4-2-2.	3-7-0	"	—	—	—	5-5-1.	2-4-4.	0-9-5.	
7	3-10-6.	3-5-4.	"	—	—	—	5-3-2.	2-4-4.	1-0-5.	
8	3-7-0	3-3-3	"	—	—	—	4-10-6.	2-4-6.	1-4-7.	
9	3-2-2.	3-0-6	"	—	3-2-4.	3-2-6.	4-8-2.	2-5-0	1-9-4.	ON BASE LINE:-

DIMENSIONS HERE GIVEN ARE TO OUTER FACE OF THE PLANKING:-



Detail drawing showing stempiece, keel, and skeg of Flashlight

pearance of the boat. Wherever two pieces come together as a joint no matter whether frame or plank, it is quite desirable before fastening to coat the two faces which come together with a smearing of white lead paint.

Since upon the fastenings will depend greatly the tightness of the boat, see to it that each and all are of the kind most suited for the place where used. When spacing the fastenings, it is well to stagger all bolts or screws a small amount rather than have a straight or continuous line extending along any one grain of wood. When possible avoid black iron fastenings and use only the old standbys, made from copper, bronze, brass, or galvanized iron.

With such a little boat in full cruising trim, rigged and equipped for the season's play, hardly more could be really wished for. If looked after and cared for properly and continuously throughout the year, not only while in commission and afloat, but when hauled out as well, such a little craft is bound to have a good market value should incidental events or unlooked for happenings (such as a fattening bank roll or growing hankering for a boat that's ever so much more elaborate) cause you to wish to dispose of her.

Taken all in all, Flashlight with her comforts and conveniences is a well proportioned and attractive little craft for the purpose intended, so here's wishing you all success and good luck should you decide to go in for one.

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STEM:-	OAK OR HACKMATACK KNEES:-	TWO PIECES AS SHOWN:-
STERN:-	SPRUCE AND OAK FRAME:- CEDAR PLANKS	SEE DETAIL DRAWING:-
FRAMES:-	WHITE OAK 1⅛" THICK:-	SEE DETAIL DRAWING:-
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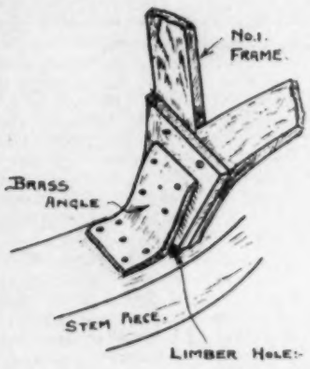

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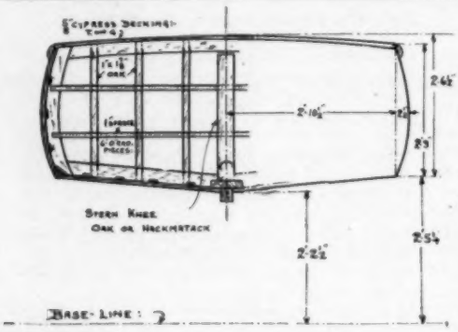

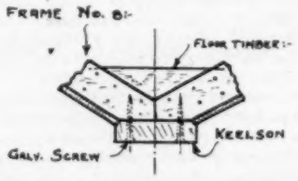

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Various suggestions which will be helpful in fashioning details of Flashlight's construction. Note below a simple type of engine bed

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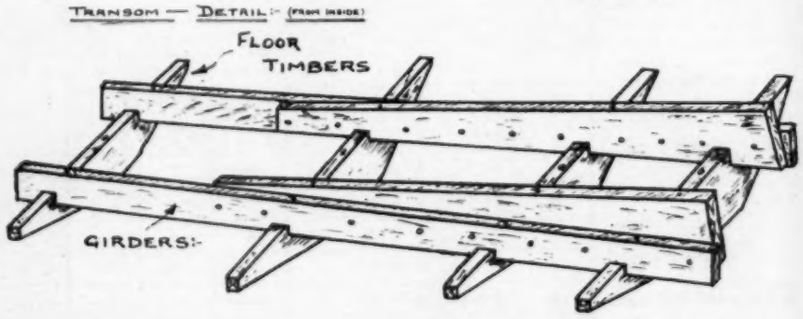

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The Question of Whether a Marine Motor Should Be Acquired from the Factory or Through a Middleman Answered in Favor of the Latter—His Personal Attention the Chief Decisive Factor

THE PRIZE CONTEST—Answers to the First Question in the April Issue

Patronize the Agent

(*The Prize-Winning Answer*)

WHENEVER possible it is best to deal with the agent. As a rule the agent is a man having intimate knowledge of the motor he offers for sale. When you buy from him you are getting expert opinion and securing the same service that you would get if you had a man come from the factory.

Desirous of building up his business, the agent will go a great way to please the buyer, and afterward, in securing the inevitable small parts, he has them in stock or can get them in short order through his code system.

If perchance the motor should develop some weakness, there will be less trouble in adjusting matters with the makers through the agent. He is the interested third party to whom the manufacturers will lend an attentive ear. With his knowledge of affairs at the time of purchase, his supervision at the installation and his subsequent investigations, the most exacting company will "come across" without the red tape and delay that is usually the case when the buyer does business with the makers direct, when many miles separate them and the mail is the medium of conducting the business.

For the most part the freight and other transportation charges are eliminated when business is done through the agent, especially a local agent. Furthermore, it is the method preferred by the manufacturers for several obvious good business reasons.

Lastly, the agent offers the opportunity to exchange an old motor in part payment for the new and where the buyer wishes to pay on instalment, he finds the agent willing to do business along lines that most manufacturers will not consider.

JAMES E. MURPHY, New London, Conn.

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The Why and Wherefore of Agencies

THE way to get business is to go after it, and personal solicitation gets more orders than catalogues and correspondence. Only a very small proportion of any engine manufacturer's customers can pay a personal visit to his plant, so the bulk of orders is obtained through direct factory branches, regular agents, or traveling salesmen.

A manufacturer naturally has a greater interest in his product than an agent, who generally works on a commission basis, or a salaried salesman, as these often change their associations from year to year, and their interests are strictly financial, while the manufacturer strives to build up a name and standing for his product, and with him there are many things that mere money does not represent. For this reason it would be ideal if all sales could be made direct from factory to purchaser, since satisfactory and prompt service would be always assured.

But, owing to geographical and other reasons, this is not possible, and distribution of his product through agencies will produce the best results. So many engines of different designs, ratings, materials, prices, etc., are now being marketed that most buyers have to be shown why one engine is better than all others for their requirements. Nice catalogues, advertising matter, etc., will influence a prospective buyer to investigate the claims and merits of an engine, but he is likely to buy the engine he sees before him after a thorough examination of it and comparison with others. By having direct factory branches in different sections of the country which carry complete lines of sizes, parts, etc., with competent agents reporting to the nearest factory branch, a manufacturer can reach in a direct way the prospective buyers of all sections, and demonstrations are thereby made possible, by means of which many sales will be made that would go to others if canvassing were done only by correspondence.

Local agents can supervise installation so that their engines will receive proper care and be correctly connected up in all ways. Slight adjustments represent sometimes the difference between satisfaction and continual trouble. Correspondence with a distant factory would consume time and not always be productive of satisfactory results, as some condition might be omitted in writing to the factory. Therefore, I think prospective buyers will do better to buy an engine from a direct branch or a regular agent than from a distant factory.

A pleased customer means an enthusiastic talker-up and a demonstrator for the engine, so that an agent will always try to give his customers prompt and efficient service for the sake of prospective orders. When an agent is successful and is making good with a certain engine it is to his interest to stick to it. The factory makes money, too, if he does, so permanent relations, which should prove satisfactory to factory, agent and the purchasers, should be established between them.

The manufacturer should keep his name and that of his engine constantly before the public by the continuous use of space in high grade publications of wide circulation, so as to reach and interest prospective buyers, and to bring them in touch with his branches or agents, so that every inquiry can be followed up by a personal call of a posted representative. Good business is bound to follow from such a course.

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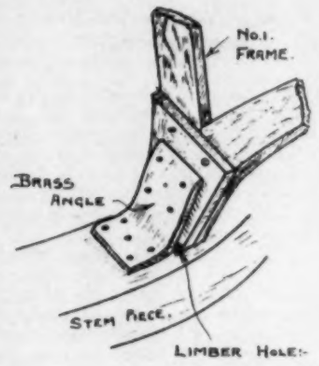

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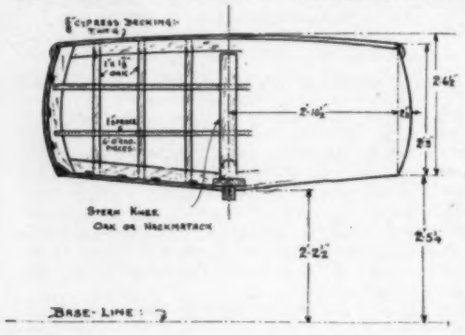

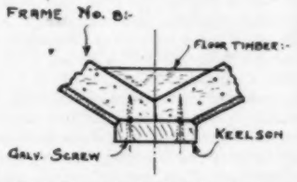

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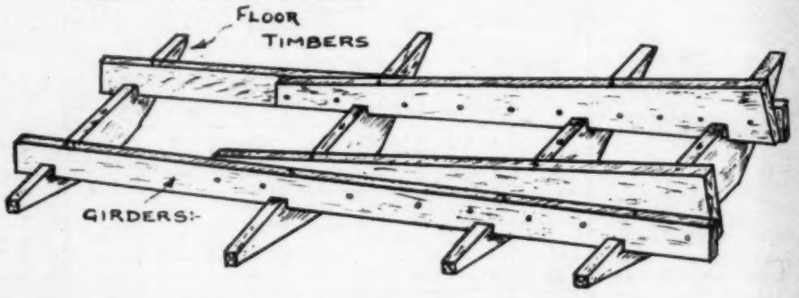

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PRIZE CONTEST

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Therefore, patronize your engine agency just as you deal with your grocer and other retail merchants.

H. H. B., Schenectady, N. Y.

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Personal Knowledge the Governing Factor

WHILE I should not recommend that everyone follow my example, I prefer to purchase from the factory direct, where the factory makes a price on its product that allows the purchaser to profit by the elimination of the middleman, or agent.

The reason is simply economy. When a manufacturer must sell his goods through an agent, prices must be made to allow the agent to profit thereby, and, as an agent seldom sells motors wholesale, the commission must be fairly high. When the price is the same, whether bought from the factory direct or through an agent, then, of course, there is no advantage to be gained in this manner.

Now, if I were inexperienced, if I did not have a working acquaintance with a number of motors of different makes and types, if I had no means of judging the reliability of the makers, then I should prefer to purchase my motor from an agent. Provided, however, that he was a resident of my own town, where I could get to him with my little tale of woe if I had trouble with his motor. I could tell him things, you know, that Uncle Sam would not allow me to send through the mails.

Then, again, I should wish to know something about the agent—whether he was simply a salesman, or whether he really knew more about a motor than I did. Good advice is seldom acquired from those who do not know what they are talking about.

T. U. G., Orange, Texas.

* * *

Consideration of Various Factors

WHETHER or not one should buy his marine engine from an agent, or direct from the factory, depends upon quite a number of different factors.

For example: If one had very little general or specific knowledge of engines, he would do well to consult a reputable agent, or several of them, and thus secure pointers as to the desirability of different types of equipment. There is also great advantage in being able to actually see the equipment you wish to buy. Illustrations and blueprints are all right for those familiar with detail plans, but nothing helps more than a good look at the engine itself. On the other hand, if one had considerable knowledge of engines, gained by actual experience, he could as well write to the factory which manufactures the type of engine he desires, and order his equipment direct. In such a case, he could take up in an intelligent way different features with the factory and secure a great deal of valuable information which might apply to his particular case. But again, even if one has general knowledge of equipment, it would be of great advantage to patronize, where opportunity offers, an agent who carries considerable stock—especially repair parts. Spare parts are expensive and there is always a great question as to the particular ones that should be carried. While the agent must carry a complete line of parts the user could not afford to carry more than a few, and they will be those which are most likely to cause trouble.

A great deal also depends upon location. There are many places where—on account of the small amount of business which the agent can do—he only acts as a third party carrying very few spare parts, if any at all, and has very little more knowledge of the equipment than the actual user. In such cases it would be best to patronize the factory.

Therefore, we can summarize as follows:

1. Patronize an agent if he carries a good line of equipment, especially a good stock of spare parts.

2. If you know exactly what you want, buy direct from the factory unless there is some great advantage in patronizing the agent.

3. Do not hesitate to buy direct from the factory if there is no agent available. In other words, do not go out of your way to deal with an agent in another locality. If you have no agent in your own locality, you might just as well deal with the factory, provided it will allow you to do so.

4. Do not hesitate to ask the factory for information, making your inquiries definite and specific and giving actual data as to your requirements. Nothing will indicate unreliability of either factory or agent more quickly than willingness to sell you something without actual knowledge of your requirements.

5. You stand a great deal more risk of receiving equipment from any source unsuited to your requirements, than you do of receiving equipment which is unreliable. Accurate data will prevent the former. Be sure you know what you want before you make purchase.

Louis R. Lee, Columbus, O.

* * *

Seeing Is Believing

THE relative merit of dealing through an agent or direct with the manufacturer is, of course, determined by the measure of satisfaction derived by the buyer through the transaction. This, in the long run, assuming that good material is originally supplied, is dependent upon the service afforded the buyer in the way of assistance rendered in selection, proper installation and equipment, prompt replacement of worn or broken parts, repairs and adjustments by a mechanic familiar with a certain engine and many other aids to perfect satisfaction with the engine purchased.

There is no question about its being more satisfactory for the prospective purchaser to visit a salesroom and select what he requires than for him to order by mail. After the engine has been purchased its proper installation is most likely to be assured if done by a mechanic who is familiar with every detail of the engine purchased and is accustomed to installing it.

As time passes the feature of service becomes more important. Wear eventually, and accidents occasionally, make it necessary to replace parts. If spare parts are immediately available from the stock which every good agents carries, no time is lost; whereas if it is necessary to send to the factory for the parts, delay is entailed in communicating with the manufacturer and in transportation of the parts from the factory to the engine owner.

By no means the least feature making for the satisfaction of the engine owner is his ability to talk personally with the man from whom he bought his engine, whose knowledge of the engine's performance under widely varying conditions is often of great assistance in correcting irregularities.

Generally speaking, manufacturers have found from experience that a purchaser is better satisfied if he can deal personally with some representative of the manufacturer rather than direct with the factory by correspondence. Of course, in the territory adjacent to the factory the manufacturer is his own best agent, and it is good policy in considering the relative merits of different engines to give preference to any that are manufactured near by.

The agency principle is sound, as evidenced by its universal adoption, and it is the writer's opinion that, except where the factory is as convenient as the agents of its rivals, it is far preferable to deal personally with an efficient agent as against dealing direct with the manufacturer by correspondence.

There are, naturally, local objections in some cases where the authorized agent of the manufacturer is inefficient and, for various reasons, may not properly represent his principal. The cases, however, where agents fail to give the service and satisfaction which might be obtained by dealing direct with the factory by correspondence are the exception rather than the rule.

G. W. Brogan, New York City.

* * *

Much Depends on the Type of Motor

THE first thing to do is to decide the type of motor that one wishes to purchase. If the motor is of small, or even of medium size, enough of them can be sold to make it profitable for the agent to carry a good stock of parts and render good service. Then too, if one is purchasing one's first marine motor, the agent can often be a very present help in time of trouble, both with advice and in supplying extra parts.

But if one intends to purchase a large and complicated motor, there will be so little demand for parts and spares that the agent will not keep them in stock, and will only order them from the factory on demand. Now, it has been my experience that an owner can get parts from the factory more quickly than an agent. At least, the owner generally does get better service. The factory realizes that if the owner does not get good service, the owner will blame the motor and the factory, and the blame cannot be shifted to the agent. If an order for spares is placed with an agent, the agent may forget to give it prompt attention—agents often do just this—or else the agent may wait a few days, or a few weeks, in hope that other orders may arrive, so that they can be bunched and the transportation charges reduced. Also, the manufacturer is likely to think that the agent wants the parts for stock and not for immediate repairs.

Therefore, if the agent keeps a supply of parts and can render *service*, buy from the agent. Otherwise, deal directly with the factory.

Murray Fahnestock, Pittsburgh, Pa.

* * *

No Saving of Middleman's Profit

THE main advantages to be gained when purchasing through some established selling agency are those of personal interviews regarding the actual installation, operation, and adjustments. An agent is usually well informed in the details of internal combustion engines as a whole and of the motor which he sells, particularly so. So many problems arise when the motor is being placed that it is indeed a relief to have available some reliable and interested person with whom you may frequently confer.

You will usually find that the agent, in addition to granting information, will make occasional personal inspections of the work as it progresses and offer many valuable suggestions.

It will hardly be necessary to state that when the motor is purchased direct from the factory, the desired information is only then secured through the somewhat limited and vague paragraphs of a business letter, which leaves you idle until its arrival. Furthermore, you will probably also find by investigating, that your endeavor to save the so-called middleman's profit will be gruitless, because the factory cost will be to you the same as that at which the agent sells.

G. A. Luers, Washington, D. C.

PRIZE CONTEST

Home-Made Navigation Equipment

Two Serviceable Bearing Finders Which May Be Constructed with Little Cost or Trouble by the Average Motor Boatman—Reliable Pelorus a Virtual Necessity for 'Longshore Cruising

THE PRIZE CONTEST—Answers to the Second Question in the April Issue

An Inexpensive Instrument

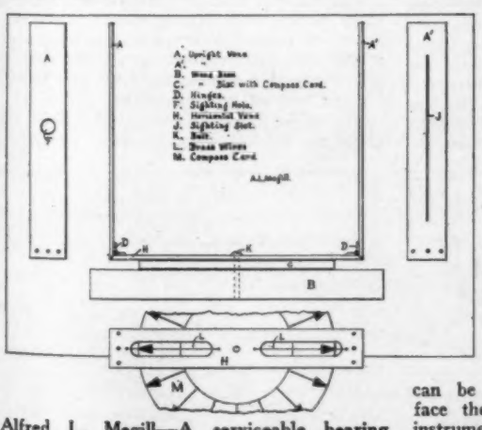
(The Prize-Winning Answer)

IF a motor boatman is to get the full measure of enjoyment out of his boat, he should understand simple navigation and be able to apply his knowledge in using the chart, locating his position, taking bearings and so forth. To take a bearing on an object, it is necessary to have what is called a pelorus or bearing finder; but, being rather an expensive instrument to buy, and yet a very necessary one, a handy man can make one that will meet all the requirements of the small boat and at the same time cost very little. The only materials needs are as follows:

Two pieces of brass 6" x 1" x 3-32" thick
One piece of brass 6½" x 1" x 3-32" thick
Two brass hinges 1" x ½"
Short flat head brass machine screws with nuts
A short piece of fine brass wire
A few brass escutcheon pins
A compass card about 5" to 5½" in diameter
One piece of laminated wood 6" x 6" x ¾" thick
One piece of wood (mahogany if desired) 8" square x ¾" thick
One round head brass bolt 1¼" long and ⅜" diameter

The compass card, preferably marked in degrees as well as quarter points, should be first mounted on a base made out of the quarter-inch laminated wood. This piece requires an eighth-inch hole at its center and the card should be mounted on it, using a good thick shellac as an adhesive, and put under pressure until dry.

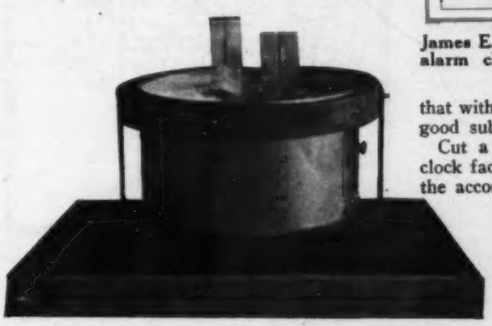
Now shape up the wood base for the whole instrument. This may be made round, octagon, or hexagon as preferred, but unless turned on a lathe it will probably look better if made either octagon or hexagon, as these shapes require only a saw or chisel to shape them. After being cut to shape and sandpapered and an eighth-inch hole drilled in the center, the block can be varnished and left to dry. It should be varnished on both sides to keep dampness out and prevent warping. There should be four brass tacks or escutcheon pins placed 90 degrees apart on the circumference of a circle slightly larger than the compass card. These tacks correspond to the lubber lines of the boat compass.



Alfred L. Megill—A serviceable bearing finder which can be constructed with a minimum of expense

Next take the 6½-inch brass piece, make a line through its middle, locate its center, and drill an eighth-inch hole. Then cut two slots, beginning half an inch each side of the center hole, about ⅜-inch wide, running lengthwise through the middle of the piece and long enough so that the divisions on the compass card can be seen through them. Drill a very small hole on the center line just beyond each end of these slots and draw the fine brass wire taut through them, so as to make a center line through the slots for getting the bearing reading, and run a little solder into the hole beneath to hold the wire in place.

Now mark the center line of the two 6-inch pieces of brass and in one piece at a little above the middle drill a hole about ⅜-inch diameter. In the other piece, saw a narrow slot exactly through the middle about 1/32-inch wide and 4 inches long and beginning 1 inch from each end. After doing this, the hinges are fastened to the ends of the horizontal piece which lies on the compass card and also to the lower ends of the two uprights. Care must be used to get the slots, wire, and holes all central and the hinges placed so that the the uprights will fold down on top of the horizontal pieces with the sides of all three parallel—otherwise there is likely to be some inaccuracy when a bearing is taken. The hinges may be fastened by the small bolts, or the holes in the arms may be tapped to take the screws, thus doing away with the nuts. After smoothing all rough edges, the brass may be given a clean dull finish by rubbing with steel wool and then coated with lacquer to keep from tarnishing. When each part is finished, the whole instrument is assembled by passing the ⅜-inch bolt through the center holes made for it.



James E. Murphy—A pelorus fashioned partly from the shell and crystal of an alarm clock

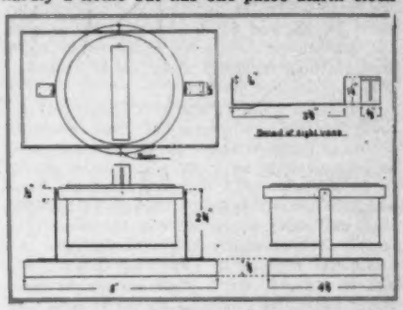
By having a very narrow slot through the second sighting vane, an object is more plainly seen and located in the center of this slot than if a wire were used through the center of a wide slot, for when focusing the eye on the distant object, the wire becomes very blurred and it is harder to locate exactly in line with the object.

If the compass is placed on the boat so that the whole horizon can be seen from the plane of its surface then a slight variation of the above instrument may be made to use directly on top of the compass, doing away with the dumb compass and substituting a skeleton brass base in place of the wood one to fit centrally over the compass card. The construction of the sighting vanes is the same and the bearing is taken directly from the boat's compass to correspond with the boat's compass before taking a bearing.

ALFRED L. MEGILL, Brooklyn, N. Y.

A Serviceable Alarm Clock Pelorus

TAKING bearings with any degree of accuracy is practically impossible without a pelorus, or bearing plate. But there is hardly a home but has one passé alarm clock that with a little labor can be made into a very good substitute for a pelorus.



James E. Murphy—Plan and elevation of the alarm clock pelorus, with a detail of the sight vane

Cut a paper dial to the same size as the clock face and draw a compass rose on it. In the accompanying illustration the clock had a 4-inch face. Five concentric circles were drawn in making the compass rose, the innermost being 1 inch from the center and the outermost, 1⅞ inches.

A strip of brass 5⅞ inches long is bent with 1¼-inch sight vances. A slit 1-inch long and the width of the saw blade is sawed in each upright. A 1/16-inch strip is soldered to the top of each upright to enclose the slit and to strengthen the top. The minute hand is soldered to the under part of the sight vane and bent as shown in the detail.

The hand is fastened a little off center so that its tip will protrude beyond the upright, thus allowing the bearing to be quickly and easily read.

At the north point of the compass rose a small hole is bored to enable the operator, with the aid of a pencil or a match, to move the compass into alignment with the boat's compass. Lubber lines are drawn on the inner side of the clock body opposite the cardinal points.

Gimbals are made out of sheet brass cut to a width of half an inch. The pinions are ¾-inch copper nails soldered head on. At about an eighth-inch from the end of each nail fastened to the clock body, solder a copper burr to prevent any sliding movement on the pinions.

When the whole is assembled, pieces of lead are fastened to the inner side of the clock body to give balance to it when hung on the gimbals.

To use, place the substitute at a point where the object to be viewed is easily sighted. Turn the compass rose until it is in accordance with the boat's compass. The object is sighted through the slits and the tip of the minute hand then points to the bearing.

Besides being a practical help to the mature mariner, it gives the beginner a chance to fit himself for the finer points of navigation.

JAMES E. MURPHY,
New London, Conn.

PRIZE CONTEST

The Pressure Water System

Unfailing Supply of Water for Galley and Lavatory Assured by Simple Means—The Possibilities of Utilizing the Whistle Tank for the Necessary Pressure—Warm Water from the Exhaust

THE PRIZE CONTEST—Answers to the Third Question in the April Issue

A Hot Water System

(The Prize-Winning Answer)

IT is quite essential that the small cruiser of to-day should have running water in the galley. It is further desirable that not only the fresh water for drinking and cooking purposes be allowed to flow to the galley sink, but that some means be provided for bringing from without, running water either heated or cold for sanitary purposes.

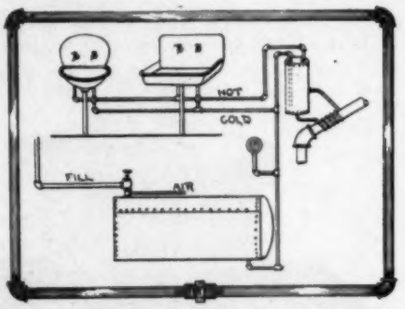
It is quite possible and practicable that the tank or tanks containing the fresh water be placed at a height above the faucets. By such an arrangement the water will flow by gravity to its lower outlet. In many instances, however, the gravity system, although perhaps the least expensive to install, will have its drawbacks. The necessary height of the tank may make the refilling a somewhat difficult job, and if the capacity is great its weight when fairly filled and splashing about is hardly desirable on a small boat. Moreover, water thus stored is more likely to become insipid and flat.

If for any of the foregoing reasons or if space is at a premium, the tanks can readily be located below cabin or cockpit floors, or beneath lockers, etc. With such a placing of the tanks, however, the water is raised by pump or air pressure to the points desired.

Such an installation is clearly outlined in the diagrammatic sketch in Fig. 1, wherein the pressure from the whistle outfit is utilized by simply piping into the pressure line of the existing air pump, actuated by the engine. Provide shutoff cocks or valves at locations in keeping with those shown in *A* and *B*. With the air pumps in operation and valve *A* closed and *B* opened, air is taken into the whistle tank. When the pressure gauge registers a sufficient amount, the pump can be stopped and while valve *B* is still open, some of the pressure can be led to the air space in the water tank by opening valve *A*. By repeating operations at intervals or when pressure is noticeably low the results are all that can be desired if connections are well made and tanks are of sufficient rigidity to withstand the pressure.

The indicative sketch in Fig. 2, shows a separate installation for providing water at the galley sink or elsewhere for washing or toilet purposes. Here a small low-speed rotary or plunger pump draws water from without the craft, forcing it through a heater connected to the exhaust manifold of the motor if warm water is desired, or beyond the heater by means of a by-pass if cold water is wanted.

The heater itself as shown is simply a flanged cylindrical body casting with separate closed ends. To the flanges at each end of the body and between the closed end castings is attached a steel tube plate, drilled for a tube arrangement similar to that shown in the sketch. The tubes are expanded tightly in the tube sheets, metal to metal. The water is pumped into the body of the heater at the inlet boss on the bottom, and fills up the space around the tubes, overflowing from the boss at the top to the sink or lavatory. The hot exhaust gases



W. B. Moores—A single-tank pneumatic system

passing through the tubes and the slow action of the small pump insure a steady stream of quite warm clean water. It is quite desirable that an outlet pipe on the delivery side of the pump should be carried well above the highest faucet. This should always be left open to drain outboard as a safeguard in case the pump is left running with all faucets closed.

C. E. Bradley, Fall River, Mass.

* * *

Coils for Hot and Ice Water

NEARLY everyone has noticed the renting agent's advertisements ending something like—"three room apartment, kitchenette and bath; all modern improvements." Now if you will apply this to your cruiser you will find the kitchenette in the galley and the bath on all sides. The modern improvements, hot and cold water are not hard to install and you will agree that the cruiser far surpasses the apartment.

There are two methods of delivering the water to the fittings—by gravity and by compressed air. The gravity system requires that the tank be located on the cabin roof or other elevated position where it is unsightly, and the water does not keep well on account of the heat.

The pneumatic system requires that the water be forced into the tank under pressure, and that compressed air be supplied from an independent source, but the tank many be located anywhere in the boat, where it will be out of the way, and least affect its trim and balance. Placed on the keel (or in the event of two tanks, one on each side), an equal weight of ballast could be removed and the water would keep cooler and better.

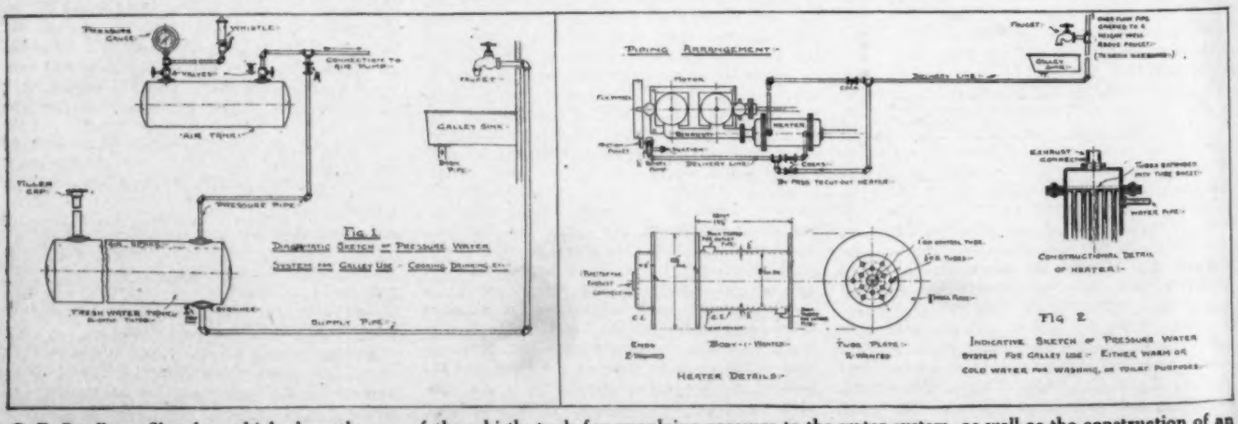
The following system is designed to furnish hot and cold water for the galley, lavatory, etc., under air pressure supplied from the air pump or a hand operated tire pump. Pressure produced by an air accumulator on the cylinder cannot be used, as the burned gases would dissolve in the water, spoiling it.

The pipe for filling, which should be at least ¾-inch diameter, is led to the cockpit, having at its outer end a removable strainer and a cap. A check valve or a globe or angle valve at the tank is necessary. Both are advisable. The air pipe of annealed tubing should lead from the top of the air tank, or to the hand pump if one is used, and is provided with a check valve at the tank and a shutoff.

The supply pipe leads from the bottom of the tank to all cold outlets and to the hot water tank, and a pressure gauge is placed in the main riser from the tank. The piping should be ⅜-inch or ½-inch diameter galvanized or brass (preferably ½-inch diameter as most standard fittings are ½-inch), and installed so as to drain to a tee in the lowest point in the line.

Spring closing cocks or bibbs are advisable as they must be held open and close themselves when let go, thus saving water. The joints should be painted with red lead or joint compound and well screwed up. If the lead is put on the pipe only, back of the first thread, no lead will get into the system.

The water heater is similar in construction to the hot water back and boiler on a kitchen



C. E. Bradley—Sketches which show the use of the whistle tank for supplying pressure to the water system, as well as the construction of an exhaust heater

PRIZE CONTEST

range. A small tank is located near the motor and ½-inch O. D. annealed tubing is run from the bottom, given several turns around the hottest part of the exhaust pipe, and returned to the tank at or below the center. Asbestos cement over the coil will retain the heat. Heated gases and liquids rise and the water will circulate through the coil, keeping the whole tank hot long after the motor has stopped.

The cold supply leads in at the top and the pipe descends inside the tank to within two or three inches of the bottom. The hot water leaves the boiler at the top.

A coil placed in the ice chamber will furnish cold water for drinking.

The size of the main tank depends upon the facilities for supply, and the number of persons to be supplied. For drinking, cooking and washing, an average of three or four gallons per person might be suggested.

A pressure of approximately 45 pounds per square inch would force the water 100 feet above the tank or a mile in a horizontal position, and half this pressure would be sufficient to empty the tank. With a little practice one will soon get accustomed to determining the amount of water in the tank by the pressure.

W. B. Moores, Newburgh, N. Y.

* * *

Three Practical Systems

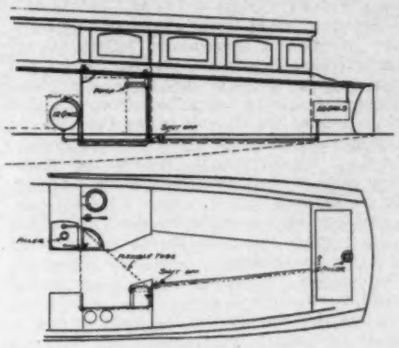
I AM presenting three types that are simple, compact, and applicable to any type of cruiser.

The first of these is most simple: A small water pump of any type—the one shown is a rotary—is driven from the main shaft; the water, drawn through an inlet in the bottom of the boat, is pumped into a five-gallon tank set high, wherever convenient (this holds a reserve supply for use when the engine is not running) and is then piped to the faucet; an overflow outlet carries the surplus water to the sink outlet.

For a boat having either a self starter system with a large storage battery, or a generator and battery for lighting, the second system is best. A small rotary pump is geared to a small low-voltage motor, mounted on an oak base; the pump is geared low (probably 6 to 1), according to the size of the motor; the water is piped to the sink; the motor is wired to the storage battery and to a switch or button at the sink. The advantages of this system are an instantaneous, unlimited water supply by merely pressing a button which starts the motor; a positive flow; a pump which runs only when water is required; and no tank.

Fig. 1, illustrates a system which combines some of the advantages of the other two systems: A rotary pump, having a driving pulley and an idle pulley, is belted to the main shaft; the water is piped directly to the sink, or, a tank may be used; the belt is shifted by a small battery motor, by the use of a rack and pinion, controlled by a three-pole, double-throw switch at the sink.

A small motor, shunt field type, is required, and the current—on for a few seconds at a time—may be obtained from a few dry cells if no storage battery is used on board.



Ernest B. Wheeler—A two-tank system wherein the pressure is supplied by hand pump

The motor and pump are mounted on an oak base; a small pinion, *A*, is fitted to the motor; to a piece of brass rod, *C*, about ¾-inch square, a piece of rack, *B*, slightly longer than the distance required to shift the belt, is fitted; two bearings, *D*, of square brass tubing are mounted on oak blocks; a belt guide, *E*, of strap brass is bent into a U shape and fastened to *C* with machine screws.

The sliding contact, *F*, *G*, is shown in detail in Fig. 2. Two strips of brass, *G*, ¼-inch wide and 1/16-inch thick, are mounted with 1/16-inch space between them, on an oak block directly below the rod *C*; a small piece of thin spring brass, *F*, the correct width to just cover the two brass strips, is fastened to the under side of *C* and the end is turned up. A three-pole, double-throw switch is mounted at the sink and the system is connected as shown in Figs. 1 and 3.

The cycle of operation: The switch is closed at the sink and the motor revolves, moving the rack and pushing the belt on to the driving pulley; when the rack has moved far enough, the sliding contact, *F*, runs off the end of one brass strip and shuts off the current. The water will now flow until the switch is reversed; this reverses the field in the motor and it revolves in the opposite direction, moving the belt on to the idle pulley; the sliding contact shuts off the current at one end of the switch, but it can be thrown on at the other end. Label the switch "Off" and "On."

Both this and the second system may be used to pump fresh water from tanks carried under the cockpit or elsewhere, if desired.

Albert T. Gray, Dover, N. H.

* * *

A Two-Tank System

THOUGH our cruiser offers us the opportunity of getting away from the cities' hurry and flurry, we are loath to give up the city conveniences. With this strongly in mind the arrangement illustrated was worked out for a 33 x 8-foot cruiser, with center cockpit and after cabin.

The arangement consists of two tanks, a supply tank 10 x 20 x 44 inches of 38-gallon capacity, located under the after deck, and a pressure tank 18 inches in diameter by 12 inches long of 12-gallon capacity under the cockpit seat. These are connected by ½-inch galvanized pipe with branches to the galley sink and the lavatory. Between the branch to the galley sink and the supply tank is installed a shutoff.

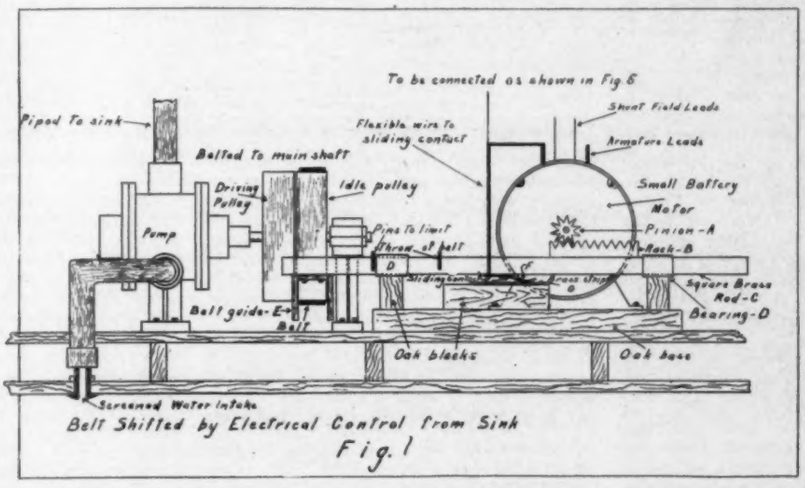
The smaller or pressure tank is fitted with large filler cap with rubber gasket and automobile tire valve, and this is connected by flexible brass tubing to an 8-inch stroke and 1¼-inch bore pump, located under the galley sink. A few strokes of this pump will give pressure enough in the tank for the average day's use.

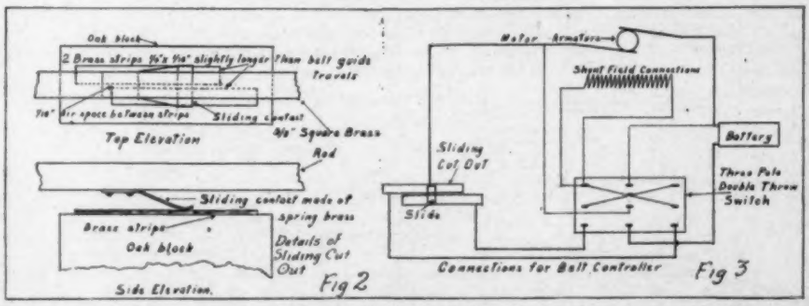
The shutoff serves two purposes: it confines the pressure to the small tank and serves as a means of filling the tank.

When the small tank has become empty or nearly so, opening the shutoff fills the small tank to the level of the supply tank, and as the tops of tanks are on the same level there is no danger of overflowing the small tank. As the small tank is 18 inches in diameter and 10 inches deep this leaves 8 inches of water in the small tank when the supply tank is empty.

In larger boats where the engine is fitted with the compressor, the pressure could be mechanically supplied.

Ernest B. Wheeler, New Britain, Conn.





Albert T. Gray—An ingenious electrically-controlled water supply system, with diagrams of the wiring and switches

Building a Flying Boat

Practical Suggestions for the Construction of a Two-Passenger Triplane—A Hydroaeroplane Which Is Well Within the Capabilities of a Resourceful Amateur Carpenter

By Cyrus Wilson

PART I

THROUGH many ages the possibility of human flight was classed as an attainment impossible, but for all that and, as usually happens, the impossible has happened and as fledglings men are doing right well in the air, already outstripping nature's feathered children in the matter of speed.

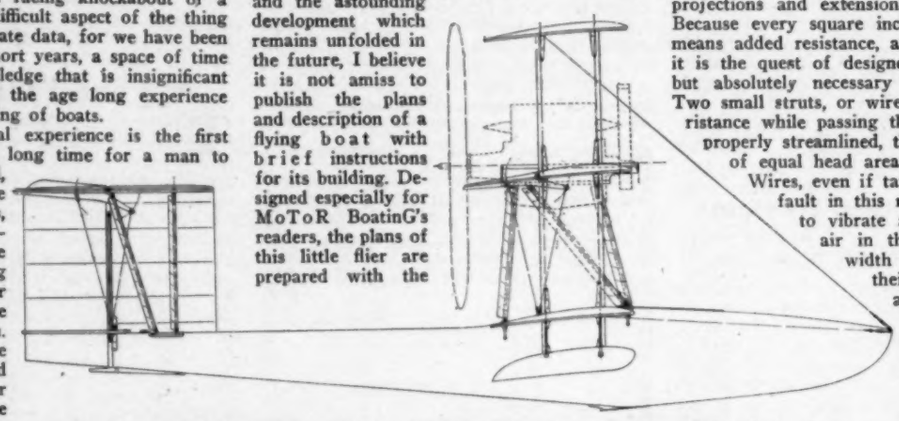
After all, it is surprising how comparatively simple the whole problem or aerial flight is; that is, after one knows something about it. The calculations for the machine's stability, its weight, its center of gravity, of lift, its head resistance and speed are hardly more difficult of solution than those necessary for the designing of a racing knockabout or a motor boat. The difficult aspect of the thing is our lack of accurate data, for we have been flying but eleven short years, a space of time for grasping knowledge that is insignificant when compared to the age long experience gained in the building of boats.

Although personal experience is the first teacher, it takes a long time for a man to learn from it, and, as a certain close friend of mine says, "it costs so much"—one either has the undertaker standing by to windward or is on the way to the poorhouse, or both. So it is profitable and better to read and take the other fellow's experience for much of the work one has to do.

It was only a few years ago that M. Bleriot achieved fame for himself and the frail monoplane he piloted by flying across the English Channel from Calais to Dover, yet to-day flocks of aircraft make the passage and continue it to the battlefront, returning to England the same day. Great Britain alone has invested over $250,000,000 and has above 500,000 persons employed in her air service. Thousands of machines keep the air continually, regardless of weather conditions, through gun fire, through shrapnel—through anything—and no one thinks anything about it. The marvelous aspect of it all has been dimmed through its having become but part of the regular day's work.

At home, which perhaps interests us more, the Government appropriated $18,000,000 for the purchase of aircraft, their equipment and maintenance for both the Army and Navy. Aeroplanes and aviators have been assigned to several of the stations in the Coast Guard service, and Congress has authorized the use of them for carrying the mail to out of the way parts of the country where roads are yet in the making.

Because of the wonderful effect flying has already made upon the destiny of humanity and the astounding development which remains unfolded in the future, I believe it is not amiss to publish the plans and description of a flying boat with brief instructions for its building. Designed especially for MoToR BoatinG's readers, the plans of this little flier are prepared with the knowledge that it will be built by amateur boatbuilders or by professional workmen unfamiliar with the intricacies of aeronautical construction. Therefore, the craft in toto and the hull especially, are of the simplest form, yet retaining all the features necessary for the creation of a successful machine and one most easily built by men without the facilities possessed by a modern aeroplane factory.



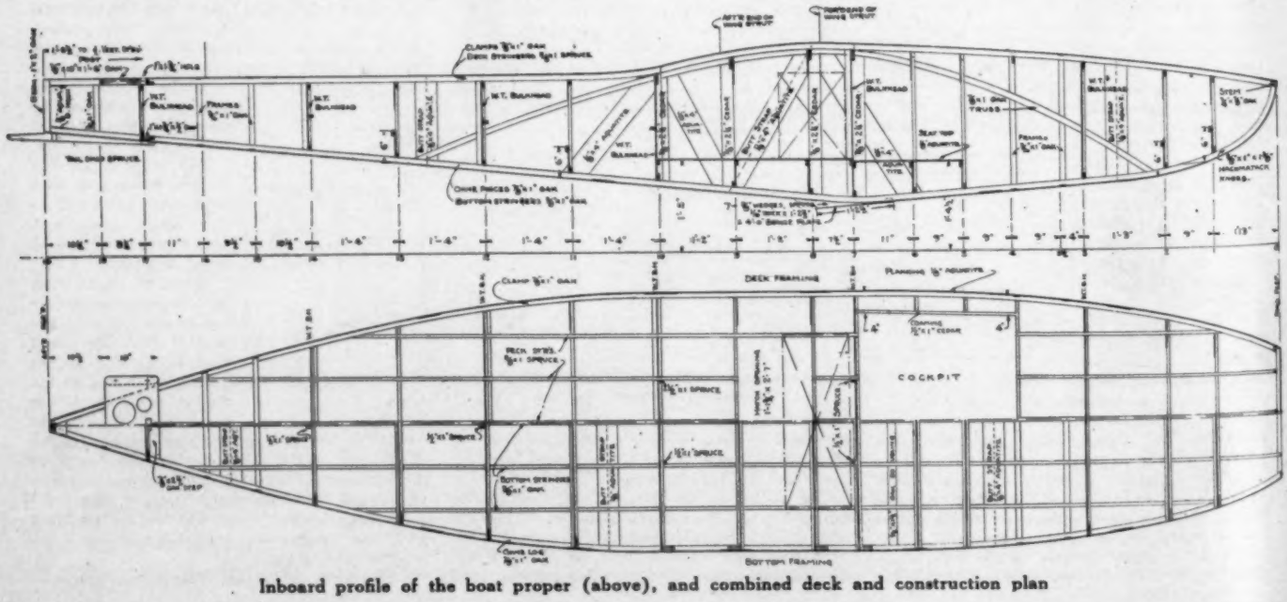
Side elevation of the completed flying boat, showing the disposition of the three planes

A triplane was decided upon on account of its small wing spread, which is a paramount consideration for the novice in the matter of finding a roof to build it under and to protect it when built. A triplane has a number of other good points, too, not the least of which are its inherent strength and efficient planes, which permit of high speed and thus greater safety. As the fastest, and one of the finest, aeroplanes built in America is the Curtiss triplane scout, this type bids fair to replace the biplane for many purposes, and with it as a precedent and also a fleet of Curtiss triplane flying boats—the largest ever built anywhere—to augment it, the triplane is a logical choice and a first class type to develop.

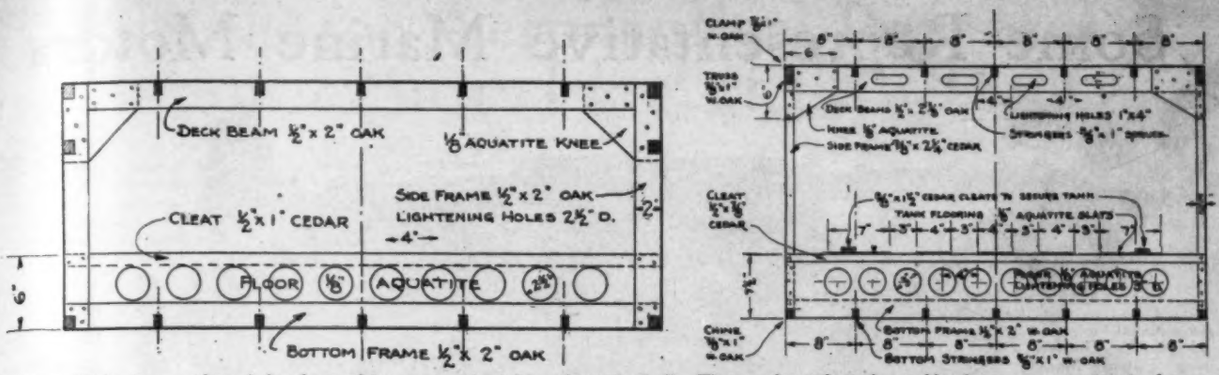
To those who are acquainted with aircraft design it will be observed that there is a minimum of wire stays, miscellaneous struts, projections and extensions on this machine. Because every square inch of head surface means added resistance, and thus less speed, it is the quest of designers to eliminate all but absolutely necessary fitments or parts. Two small struts, or wires, offer greater resistance while passing through air, even if properly streamlined, than one large strut of equal head area and correct form. Wires, even if taut, are especially at fault in this matter, being prone to vibrate and so disturb the air in their vicinity for a width much greater than their small actual diameter. That is why some of the new machines have all fixed wires encased in wooden sheaths of streamline section, the added weight being more than offset by greatly lessened resistance.

The hull is a plainly built, canvas covered, flat bottomed and square sided boat, and admittedly not of equal design to a round bilged and decked craft of the accepted model; nevertheless, it will fulfill its purpose with credit without the employment of super-expert artisans for its completion.

The universal practice wherever boats are built from plans is to lay the lines down full size on the floor, for only by this method may the correct form of the stem, stern and other parts of the craft be positively found. In



Inboard profile of the boat proper (above), and combined deck and construction plan


DECK BEAM ½" x 2" OAK
⅛ AQUATITE KNEE
SIDE FRAME ½" x 2" OAK
LIGHTENING HOLES 2½" D.
CLEAT ½" x 1" CEDAR
FLOOR ⅛ AQUATITE
BOTTOM FRAME ½" x 2" OAK

Sections which give an idea of the thwartship construction throughout the hull. That at the right is frame No. 8, an open section in the way of the wing panels, and at the left frame No. 11, another open section, looking aft

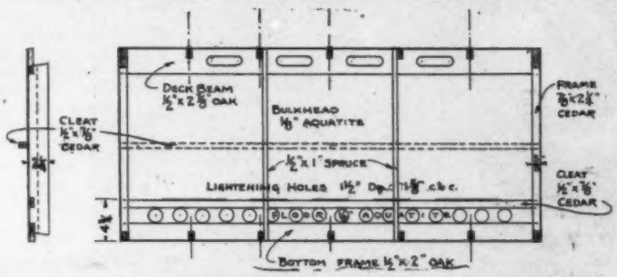
building the hull, and also the wing structure, of the flying boat at hand this procedure is doubly vital. In fact it should be carried farther in building so complex a mechanism as that of a flying boat and every part must be drawn full size on heavy paper. In making these drawings it is not necessary to fill in all the details, but a general drawing of each hull section, and of the construction profile is necessary, as, also, are full-sized drawings of the wing beams, wing curve, ailerons, vertical and horizontal stabilizers, rudder, wing struts, etc. This may all seem unnecessary work, but it is as requisite for properly carrying on the building as materials and tools, for the time spent in preparing the full sized drawings is actually thrice saved before the craft is ready for flight. The line drawing presents the vertical heights and half sections of the hull at each frame with the frame intervals.

Detailed instructions for laying down the craft and continuing its construction are, to one familiar with the use of woodworking tools and acquainted with boat-building methods, quite superfluous, for, after all, it requires considerable experience in carpentry —despite some of my contemporaries who, from their writings, believe that anyone can with or without experience build any kind of a boat from the say-so of well written instructions. Alas, it is not so. But the man who knows something of boat construction and loves it is quite equal to solving all of the little details that continually crop up, thus creating a mental exercise that is part of the pleasure of working.

The hull is 19 feet long, 4 feet wide, and 2 feet 5 7-16 inches deep at frame No. 7. It will be noticed from the lines that between frames No. 6 and 10 inclusive the boat's sides are parallel to the centerline. This is to make more easy the attachment of the superstructure and is mentioned because of its especial importance. Also the width here, to the outside of the canvas, must be mighty close to 4 feet, else the lower wing panels will not fit properly.

Substitute woods may be found for the ones caleld for in the plans if those specified are difficult to secure. Hickory, ash, or elm may be used in place of oak, and white pine, redwood, or spruce instead of cedar, while the sharp crooks forward, on each of the chine pieces and the bottom stringers, may be steam bent if hackmatack is unobtainable. These sharp crooks are spliced to the bottom longitudinal members to simplify construction. If, however, the facilities are at hand one may make each continuous, although it will be more work.

Except for the hogging truss and the portion of the chines, clamps, and both deck and bottom stringers at the points where they make sharp bends between frames No. 6 to 11, there will be no necessity for a steam box, so if access cannot be gained to one at the nearest boat yard, contrive to fashion a flat tank of sheet iron, from 6 to 7 feet long by 6 inches wide and 22 deep, to boil these parts in, springing the parts down so as to immerse the portion that requires bending.


DECK BEAM ½" x 2⅝ OAK
BULKHEAD ⅛" AQUATITE
CLEAT ½" x ⅜" CEDAR
½" x 1" SPRUCE
LIGHTENING HOLES 1½" D.
FRAME ⅞" x 2¼" CEDAR
CLEAT ½" x ⅜" CEDAR
BOTTOM FRAME ½" x 2" OAK

Cross section at frame No. 10, a water-tight bulkheaded section

It will be a difficult thing to find a substitute for the planking, decking, bulkheads, floors, etc. This material is aquatite, a three-ply built-up wood with a total thickness of ⅛-inch. It is very strong, light and entirely water-proof—doubly so when properly painted —and is obtainable in sheets of almost any size. In connection with this particular work sheets 3 by 6 feet will cut to the best advantage, and as practically all of the cuttings may be used for smaller parts of the construction there is very little wastage.

The planking on sides, bottom, and decks (which, by the way, is the order in which it should be finished) is laid on in full-sized sheets, the butts being scattered as shown and strapped with aquatite four inches wide let into the frame-work wherever necessary.

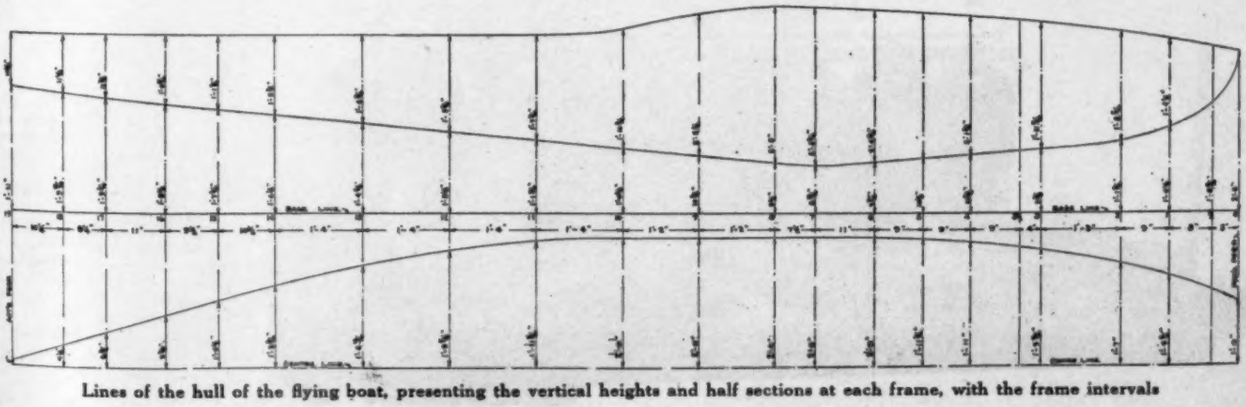
A number of lightening holes may be cut in the oak, but exercise good judgment in their location and keep their diameter smaller than two inches. The hull when completed is covered with heavy drilling or very light canvas, stretched tightly over canoe glue and then ironed to help the adhesion. Cover the canvas edges with light half-round molding to dress up the job.

There are three cross-ship sections shown in the drawings, and these are typical of the athwartship construction throughout the hull frame, No. 11 being an open section, No. 10 a water-tight bulkheaded section, and No. 8 an open section in the way of the wing panels. Nos. 7, 8, 9, and 10, as may be noticed, are different in having ⅞ x 2¼-inch side frames laid flat, these also answering as doublings for properly securing the struts and wing fittings.

Wherever possible, in building the sections, and also in other parts of the construction, cut holes in order to reduce weight. In the drawings, the floor and deck beams are shown with lightening holes. Other locations will present themselves as the work takes form, and it is left somewhat to the builder to take advantage of them. Remember always in air craft that every half-ounce means greater useful load-carrying capacity and that, although one or two one-half inch diameter holes seem an insignificant item, if they are repeated here and there throughout the craft a surprising saving is accomplished without in any way affecting the strength of the completed machine, and thereby adding much to its general all round efficiency.

The fastenings throughout should be of

(*Continued on page* 51)

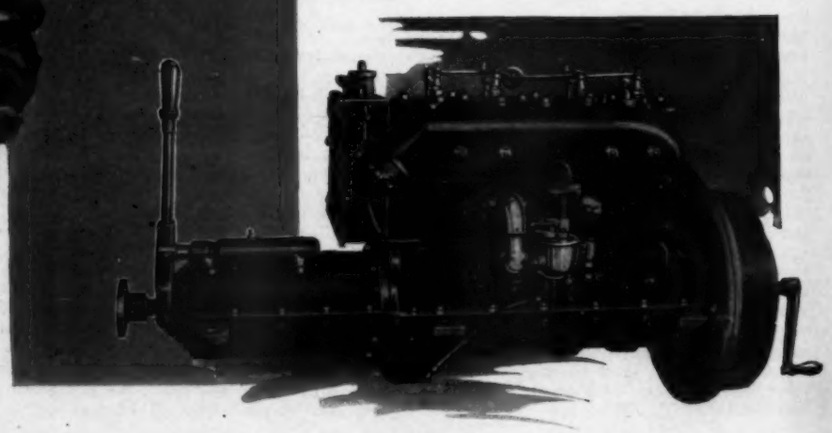


Lines of the hull of the flying boat, presenting the vertical heights and half sections at each frame, with the frame intervals

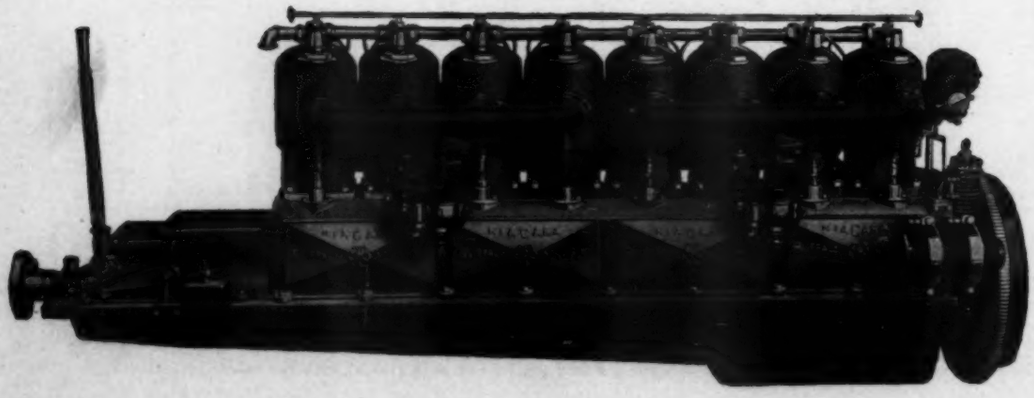
Some Representative Marine Motors

An unusual view of a six-cylinder Duesenberg Patrol Model marine motor, showing the construction of the crankshaft and the main and connecting rod bearing boxes. Note also the horizontal valves and the actuating mechanism

Above: end view of the twelve-cylinder Duesenberg motor which made its first appearance at last winter's motor boat show. The Duesenberg principle of valve actuation is now being employed with every success in marine, aeronautical and automobile motors



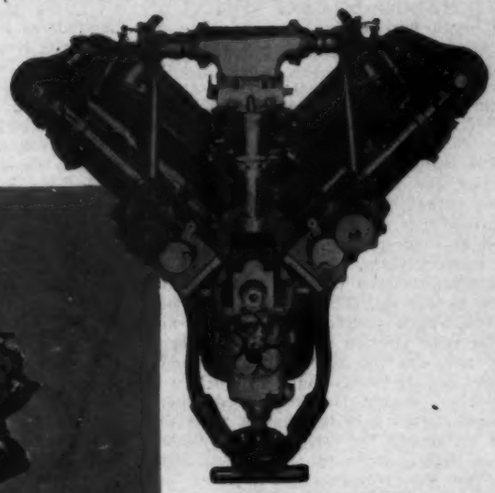
Below: starboard side of the 14-20 h.p. L-A motor, manufactured by the Lockwood-Ash Motor Co., Inc. It has four en bloc cylinders of 3¾ x 4½-inch dimensions, and while it develops its higher rated power at 1,500 r.p.m, it may be throttled down to 200 r.p.m. Every moving part, including the flywheel, is enclosed, and the planetary reverse gear is built in to form a unit power plant



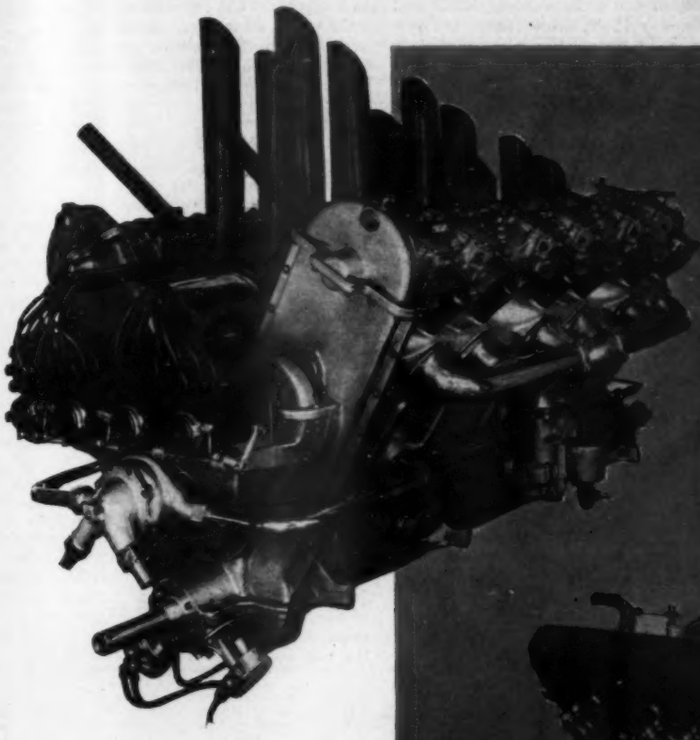
Left: the Model D-8 Niagara engine—a 6¼ x 7-inch machine which develops 150 h.p. at 1,350 r.p.m. It is a T-head motor equipped with double ignition, electric starter, flyball governor, and air compressor, and it is provided with a dependable pressure feed system of lubrication. It is declared to be extremely powerful, efficient, and economical

Engines for Aeronautical Purposes

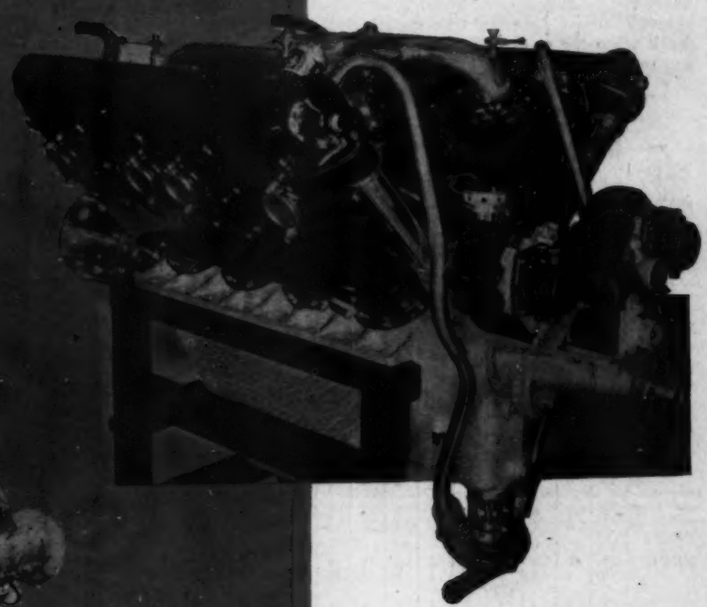
The Wisconsin twelve-cylinder aeronautical motor (below) is a direct-drive valve-in-head type with 3-inch valves and 5 x 6½-inch bore and stroke. It develops 280 h.p. at 1,400 r.p.m, and weighs complete 1,000 pounds. Four Bosch single-spark magnetos are supplied, and should one set fail the other may be used, or both sets may be operated together

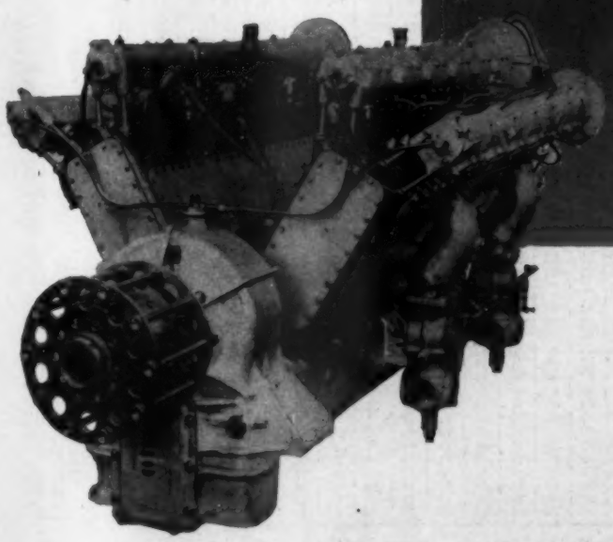


Above: End view of the Simplex Hispano-Suiza aeroplane motor, an American duplication of a famous European machine



Right: Another view of the Simplex Hispano-Suiza Model A engine. It is a water-cooled four-cycle V-type motor with eight cylinders having a piston displacement of 718 cubic inches. At sea level it develops 150 h.p. at 1,450 r.p.m., and it can be operated successfully at much higher speeds. Ignition is by two eight-cylinder magnetos firing two spark plugs per cylinder





Left: The Sterling-Sunbeam aeroplane engine is an English motor of wide fame which is now being manufactured in this country by the Sterling Engine Co. It is a V-type, 4 5/16 x 6¼-inch twelve-cylinder machine which delivers its rated 320 h.p. at 2,000 r.p.m. The reduction drive to the propeller shaft has a two-to-one ratio, so that the propeller turns at 1,000 r.p.m. The Sterling company also plans to build an eighteen-cylinder Sterling-Sunbeam of similar type

Is Your Watch Fast or Slow?

The Difference Between Clock Time and Sun Time and the Reasons Therefor—A Table for Converting One Kind of Time to the Other for Any Day

DID you ever realize that the time as shown by our watches and clocks in every day life is not correct? Very few times a year, and then only at certain locations on the earth, are they correct. They are all fast or slow, depending upon several things.

Of course, time is nothing more or less than our crude way of expressing the position of the sun at any particular moment, as it is the sun which is the master key to our lives, as well as to everything inanimate. At ten in the morning the sun has a certain position in the sky, at eleven o'clock it has another position, at four still another, and so on. But at eleven o'clock yesterday the sun did not have the same position that it had at eleven to-day, nor was the sun overhead (noon) yesterday exactly twenty-four hours before it was overhead to-day. In other words, there is a small variation in the time it takes the sun to go around the earth every day—that is, it is slightly more or slightly less than twenty-four hours from noon to noon, depending upon the time of year. This variation from twenty-four hours is called the equation of time, and may amount to as much as sixteen and one-half minutes.

There is another error in the time shown by our watches which is much greater than the error of the equation of time. Everyone knows that noon is the time at which the sun is supposed to be directly overhead or to bear true south (in northern latitudes). As explained above, it does not bear exactly true south every twenty-four hours. Furthermore, if the sun is overhead (bearing true south) at New York when the clock is indicating noon, it is not overhead at Boston, Syracuse, Buffalo, or any other place which is not in the same longitude as New York. At Boston, when it is noon at New York, the sun is bearing west of south, while at Syracuse and Buffalo it is bearing east of south. In other words, it is past noon at Boston, and before noon at Buffalo. But it would not be convenient for the clocks at Boston to be showing 12:12, and those in Buffalo 11:40, while those in New York were at 12 noon. Great inconvenience in the routine of our daily lives would result from such an arrangement.

As the earth revolves around its axis every twenty-four hours (or nearly so) and as any circle drawn around the earth is divided into 360 degrees, it is apparent that one hour of time will be equivalent to 15 degrees on the circle drawn around the earth. As east and west distance on such a circle is known as longitude, an hour's time will represent 15 degrees of longitude, or four minutes of time, one degree.

As there is a difference of longitude of over 50 degrees between the Atlantic and Pacific Coasts of the United States, it follows that there will be a difference of time of something over 200 minutes as indicated by the sun. Such a difference is too great to neglect. That is, it would not be feasible to have the clocks in New York and San Francisco indicate the same hour. If such were the case, then when the clock indicated twelve o'clock noon at San Francisco, the sun would be low down on the horizon and it would have been daylight for only a few hours. It is not practical to have the clock time and real time as indicated by the position of the sun differ by more than one hour.

For the purpose of arranging time in the United States, the country has been divided up into four divisions known as time belts, called the Eastern, Central, Mountain and Pacific. The time from one division to the next varies by one hour, but it is uniform for all points within each particular belt or zone.

As mentioned above, one hour's difference in sun time represents 15 degrees' difference in longitude. The standard meridians of longitude which have been chosen in this country are the 75th, 90th, 105th, and 120th. Places having these longitudes have clock times which agree with the sun time, except for the slight error caused by the equation of time. Places located to the east of these meridians have clock times which are slower than sun time, and the clocks in localities to the west of the standard meridians are fast.

For example, New York City is located in longitude 74 degrees west, which is one degree to the east of the standard time (75th) meridian for eastern time. Therefore, neglecting the error of the equation of time, New York clocks are four minutes slow; Boston, longitude 71 degrees west, has its clocks sixteen minutes slow. In Buffalo, longitude 79 degrees west, the clocks are sixteen minutes fast.

The table below shows the amount which must be added to or subtracted from clock time to obtain the real sun time at places having longitudes given at the top of the table, on the various days of the year, from May 1 to December 15. For example, suppose it is desired to find the sun time at a place situated in longitude 67 degrees west on July 1. Referring to the column headed 67 degrees, reading down to the line opposite July 1, we find the figure 28, and at the head of the column the word *add*. Therefore, if the clock shows 9:10 in the morning on that day, the real time is 9:38 A. M.

LONGITUDE

DATE	92° 77°	91° 76°	90° 75°	89° 74°	88° 73°	87° 72°	86° 71°	85° 70°	84° 69°	83° 68°	82° 67°	81° 66°	80° 65°	79° 64°	78° 63°	77° 62°	76° 61°
	Sub.	Sub.	Add	Add	Add	Add	Add	Add	Add	Add	Add	Add	Add	Add	Add	Add	Add
MAY 1	5	3	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59
7	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
23	5	3	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	
JUNE 1	6	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58
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13	8	6	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56
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JULY 1	12	10	8	6	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	25	28	30	32	34	36	38	40	42	44	46	48	50	52
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14	14	12	10	8	6	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
AUG. 8	13	11	9	7	5	3	1	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51
15	12	10	8	6	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52
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24	10	8	6	4	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
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18	2	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62
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23	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64
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13	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70
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20	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72
NOV. 24	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69	71
29	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70
DEC. 3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67	69
8	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68
13	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65	67
18	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66
23	1	3	5	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
28	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64

Table showing the number of minutes which must be added to or subtracted from clock time to obtain sun time

Foods for the Motor Boatman

Canned Goods and Bottled Beverages Which Form an Appetizing Addition to the Nautical Commissariat—Liberating the Galley Slave and Taking the Bother Out of Cooking

MAN has enough trouble here below without being made to worry overmuch about the daily bill of fare aboard ship. Unless he's a born chef and delights in being called one and in proving his right to the title, he's generally willing to let someone else do the cooking, feeling that his part, humble though it be, consists in eating and offering thanks for what is set before him. There are times, however, when the other sex is not represented in a motor boat's complement, and then the lordly male has to dig in and perform for himself the serious business of life. So doing, his thought first turns to canned, boxed, bottled and prepared foods of all kinds so that his attention need not be too long diverted from the real joys of cruising. Give him a few cans of soup, various kinds of potted meats, crackers, cheese, preserves, and coffee and he'll turn out a better meal in a shorter time with the least pyrotechnics than would have been thought possible. And, perhaps, having learned his lesson, he'll stock up with more of the same, so that on the next visit of the better half she will no longer find herself a galley slave. This is only perhaps. It's hard to hypothecate what a man will do when other than his own comfort is concerned, and it's more difficult still to state definitely that a woman will avail herself of the comforts that have been tendered her.

There is an infinite variety of delectable foodstuffs offered to the motor boatman in package form, and it is his own fault if he persists in nourishing himself, day after day, with bacon for breakfast, eggs for lunch, and bacon and eggs for supper. In the following paragraphs we call attention to a few articles of diet which commend themselves for their flavor, variety, ease and quickness in serving, and general excellence. We know less about calories than we do, about B. T. U.'s, but we are certain that when a man is taking his trick at the wheel during a long distance race nothing warms his innards much better than a cup of hot soup boiled in the can and served on the bridge. Proteids and similar enigmas with which the food experts juggle are also somewhat foreign to our nature, but we know that for true enjoyment of motor boating there's nothing much better than an impromptu picnic lunch served either in the cockpit or on the lee side of a boulder on shore. Here you have the materials with a little of what the manufacturers say about them. You'll have to prepare your meal without further help from us.

THE Joseph Campbell Co., of Camden, N. J., in answer to our request for information pertaining to its Campbell's soups, has supplied us with the following: "If you happen to be one of the few motor boatmen who have not provided their craft with an ample supply of condensed soups, you have an agreeable surprise ahead of you in the convenience and satisfaction afforded by this modern form of provision as furnished by our foremost soup-making concerns. There is a tempting variety among the '21 kinds' of Campbell's soups which adapts them to all kinds of tastes and all sorts of weather. They range from a delicate consommé and appetizing tomato soup to the hearty vegetable and oxtail soups, besides the 17 other palatable and satisfying variations. These soups take up very little space in comparison with their high food value, as the contents of every can supplies twice its volume of rich, nourishing soup. Every ingredient is carefully selected, and is prepared and blended by experienced chefs. The soup is completely cooked and ready to be served on three minutes' notice."

* * *

The Normanna Co., Inc., of New York City, has obliged us with the following: "The Normanna brand of imported canned specialties offers the motor boat host a real opportunity. Dependence can be placed in the quality of every item and this insures the justified satisfaction gained from the knowledge that in addition to serving something appropriate and welcome to his guests, he is offering the finest items of their kind obtainable. All of the items are packed in tins, making them convenient to carry. Included in the line are Norwegian and Portuguese sardines in all sizes of tins, some varieties being boneless and others boneless and skinless as well. They are delicious in themselves, or can be used in making sandwiches or deviled eggs. Normanna kippered herring which contains the choicest cuts of selected herring is not only delicious when served cold, but is a welcome substitute for bacon when fried with eggs. Normanna herrings in tomato sauce, soused mackerel, mackerel in Bordelaise sauce, and fresh mackerel, are carefully prepared from selected fish and with choice ingredients, and cannot be excelled for cold

A FEW ACCESSORIES FOR THE PICNIC LUNCH

In equipping for a meal ashore some kind of receptacle for water must be included. This new folding bucket possesses obvious advantages

Sometimes a less undulating table than mother earth is desirable. This outing lunch table which sells for $5 folds up into a package hardly larger than a camera tripod

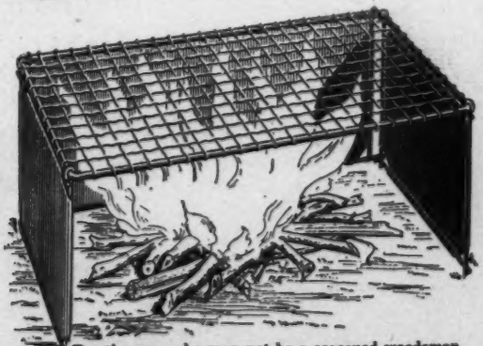
The can opener, generally forgotten, is much more serviceable in its own field than a hatchet or a sheath knife

For extended outings this collapsible stove commends itself. It folds into small compass and a complete cooking and serving outfit is packed within it

This is a container for use in carrying ready-made lunches. It is air-tight and water-proof and may be used to pack bottled beverages in ice. The cost is $1.50 per doz.

The toasting fork is another small but indespensable necessity

A basket of this kind may be packed with a complete lunch for several persons. The ice compartment keeps liquids cool



For the man who may not be a seasoned woodsman, the folding camp stove is invaluable. This style protects the fire from the wind, and concentrates the heat

Here is a new life preserver cushion which may be used by picnic parties to advantage. It is filled with Java kapoc

Do not fail to write to the editor if you desire information concerning any of the above accessories

lunches. There are many other Normanna fish products and also a Normanna olive oil of high quality which is necessary to the proper preparation of salads."

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From the **Frank E. Davis Co.**, of Gloucester, Mass., we have received the following: "Despite his close proximity to fish in their native element, it often happens that the yachtsman does not include sea food among his daily fare. He has the appetite and the liking for this kind of food, but does not care to take away from cruising the time necessary to catch the fish. Many of the yachting fraternity have found in the good things put up by the Frank E. Davis Co. just the sort of foods they want. These are selected with the greatest care as to quality, and are packed so that they keep perfectly in all weather and under all conditions. Freshly packed lobster in parchment-lined tins, crab meat of delicate flavor, sardines, sandwich fillings, lunch dainties such as boneless herrings in glass jars, anchovies, etc.—these are only a few of the many products which are put up under the Davis label that, in itself, is a guarantee of flavor and goodness. The real old-fashioned Gloucester pilot crackers, the friend of seafaring men for a generation back, are also offered by this concern."

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The Burnham & Morrill Co., of Portland, Me., which specializes in hermetically sealed products, has the following to say about its sea foods: "A whole Down East shore dinner right aboard your yacht, tucked away neatly in your larder and ready for almost instant serving with all the bother of preparation taken out—that is what Burnham & Morrill pure food products offer you. These include Scarboro beach clams, shelled and cooked, and packed in small tins to serve one or two persons, or in larger tins for the whole crowd; delicious clam juice, prepared in separate tins which may be served hot or cold according to the dictates of the weather; Scarboro beach clam chowder, prepared with the finest Maine potatoes and spicy Bermuda onions; and B & M Red Jacket lobster which is cooked and packed on the Canadian Coast. In addition to these products there are the B & M beans and pork, packed in individual tins, with rich molasses or tomato sauce as preferred. Burnham & Morrill sea products are offered in all sizes from the little individual tins up."

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Armour & Co., of Chicago, Ill., invite attention to their Armour's summer sausage: "This is a very appropriate food and one that has an exceptional taste and possesses a nourishing, wholesome and appetising quality. The delightful product contains more concentrated goodness in compact form than other foods of many times greater quantity. A small variety of Armour's summer sausage carried in a corner of the ice chest will take up little room, and its usefulness will be greatly appreciated for the meat course at dinner, for the impromptu lunch, or for a snack between meals. There is not an ounce of waste in this wholesome Armour product, it requires no cooking or preparation of any sort, and it will keep for months without ice. There are over one hundred varieties prepared by Armour & Co. this season—a brand to suit almost any taste or fancy. This sausage, to be at its best, should be sliced thin and obliquely so that the slices will be as large as possible."

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The Johnson Educator Food Co., of Boston, Mass., emphasizes the value of crackers as standard and emergency rations in the following words: "It seems to us that no motor boat or sailing yacht is completely fitted out without a supply of crackers and biscuits. Bread may do for sandwiches or other similar uses, but there are many occasions when crackers are much more convenient, while they certainly offer a relief from the monotonous white loaf which is the only thing available for boating people. Educators are the all-food crackers and quality biscuits of America. There is a kind adapted to every need and every occasion. The plain water crackers, wafers and Toasterettes provide the 'bread,' while the Grahamettes, Chocolate Thins, Triumph, Kremox, Kreamful, Digestive, and the College Line of sugar wafers furnish the 'cake.' In order to be assured that your crackers should be fresh, they should be furnished in tins, and that is where Educators are strong. The tins are lined, and the outside wrapping gives them practically a triple protection from moisture. If they should be left uncovered, however, they may be heated and allowed to cool before serving, when they will be found as crisp and fresh as when they came from the ovens."

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The California Fruit Canner's Association, of San Francisco, Cal., packs a complete line of Del Monte canned fruits and vegetables. Concerning them it declares: "It is not only the landlubber whose palate must be considered when one is away on a boating trip. Despite the usual ravenous appetite that goes with the tangy fresh air, it is important that the larder be stocked with foods that are at once palatable, easily stowed and as easily served. Del Monte canned fruits and vegetables answer to all these requirements. Second to none in quality, their infinite variety makes it possible and pleasurable to include them in every meal. Fancy serving for breakfast a great luscious peach, for luncheon a fruit cocktail and for dinner or supper a salad of cold asparagus. These are just a few suggestions from the unlimited uses made possible by the complete Del Monte line of fruits and vegetables which are picked and packed in the very orchards in which they are grown."

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Francis H. Leggett & Co., of New York City, manufacturers of Leggett's Premier pure foods, direct particular attention to their Premier salad dressing: "It seems truly remarkable that one should be able to purchase a food product that is nutritious, tasty, and appetizing, as well as healthful, while at the same time being the means of improving the taste of anything with which it is used. Premier salad dressing is all of these things, however, and is regarded by discriminating people as a universal blessing. Not only is it a wonderful tonic and an aid to digestion, but by many people it is thought to be preferable to butter on bread. No picnic or motor boat party is complete without this salad dressing, as it may be used with meat, eggs, or fish, or with vegetable or fruit salads."

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Gordon & Dilworth, of New York City, inform us that the best way to use their products on board boat is to eat them, but they amplify their remarks as follows: "Our products are all practical for boat use. We have them in sealed glass jars, as well as in hermetically sealed pails, which do not leak, and which may be left open for a reasonable time without danger of the contents spoiling. It is our experience that nothing tastes so good on salt water as a little jam, orange marmalade, or cranberry sauce, as a filler for sandwiches between meals, or a desert composed of our old-fashioned preserved fruits and jellies. Olives, tomato catsup, Mayonnaise dressing, and sweet spiced fruits, all fill in places at meal time, while our plum pudding speaks for itself, especially when served with our pudding sauce. Another item in the Gordon & Dilworth line, which may particularly appeal if the weather becomes a little too blowy for unaccustomed guests, is our calf's foot jelly which not only keeps the suffering ones alive and nourished, but actually stimulates their appetites."

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The average motor boatman is always glad when the moment comes for serving coffee and so will be interested to read what the **G. Washington Coffee Sales Co.**, has to say about its famous G. Washington's refined coffee: "It is a well-known fact that coffee brewed in the usual way aboard a boat is subject to the rolling and pitching which causes a stirring up of the grounds and may result in an undesirable coffee even though it is made in the most careful way. With G. Washington's refined coffee every cup is made to order in the cup at the time of service, and at a strength to suit each individual at the table. The coffee is made not in the galley, but in the dining saloon. The steward, instead of bringing in badly stirred up coffee, simply serves boiling hot water which is poured on the coffee in the cup. The coffee is instantly ready and there is no muddiness or fine grounds to disturb the most fastidious. Added to the above is the fact that G. Washington's coffee is 100 per cent. pure."

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Arbuckle Bros., of New York, have the following appetizing words to say about Yuban coffee: "Hot sultry days when you float lazily along and your appetite loses heart. Clear, brisk, blue and white days when you eat ravenously, work twice as hard as necessary and then eat again. And then those foggy, drizzly, chill-to-the-marrow days when a hot invigorating drink is more necessary than your charts. In every kind of weather, your coffee is the most important thing in your larder.

"No matter what other food or drink you may plan for your cruise, first take thought for your coffee. You want the very best coffee to be found—reliable, rich, and flavory. You want a man's coffee, a coffee that invigorates and satisfies; a coffee that will give you snap and vigor on gray mornings and add to the joy of sunny days.

"Such a coffee is Yuban—originally the private coffee of the Arbuckle firm—sent as a gift to friends and business associates. So popular was Yuban after its introduction to the public that it became in a very short time the favorite coffee of New York and Chicago.

"Men who taste Yuban for the first time say they never knew before how good coffee could be."

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From the **Walter M. Lowney Co.**, of Boston, Mass., we have received the following helpful hints about cocoa making: "During a recent camping trip, the writer got acquainted with cocoa made with condensed milk. Some cocoa! In fact, it's the first time the writer could ever truthfully say that he liked condensed milk better than the garden variety. Then when Mrs. Rhinehart made the same discovery in her recent trip through the Northwest, that made it unanimous.

"Condensed milk has really solved the problem of hot drinks for the yachtsman, whether he proudly sails an 80-footer or has a kicker hung over the end of his canoe. On board, however, one thing is essential; the drink that you use must not only be comforting and stimulating, but must also be sustaining. No other drink but good cocoa and chocolate will do that. Having some previous experiences in mind, you may say, 'I don't like marine cocoa.'

"Chances are more than even that you never had it properly made. Try it this way: follow directions on the can as far as boiling the cocoa for five minutes *but don't boil the cocoa after you put in the milk.* After you have boiled the cocoa and hot water as directed, stir in the milk until you get the color you like. Then let it come to the boiling point just once. Don't brew it or simmer it or anything. Make it and drink it.

"Get good cocoa to start out with, cocoa that is made by a manufacturer who makes a business of manufacturing cocoa—not selling a waste product of uncertain nutritive value. Good cocoa is known by the amount of cocoa butter (butter fats) it contains. Lowney's has about 25 per cent. fats, which is the proportion recommended by dietitians. You must have the right amount of fats if you are to make a sustaining drink."

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G. Van Heusden, Jr., of New York City, sends us the following information about Blooker's cocoa: "The manufacture of cocoa powder and chocolate comprises quite elaborate processes of sifting, blending, roasting, shelling, breaking up, grinding, mixing, pressing, heating, pulverizing, etc. Each of these processes can be done scientifically or in a somewhat haphazard manner, and the whole substance may be used or only that part of it which has the greatest intrinsic value for genuine usefulness. Thus it is that there are few of the very best kinds of cocoa among the many, that some are of second best, and that most are of the ordinary sort. The better kinds may be higher in first cost, because more elaborate and careful production, but the intensity of the process causes these cocoas to be more nutritious and more enjoyable when used in smaller quantities. This is found to be so with Blooker's cocoa, which is manufactured by a concern handed down from father to son for more than a century. It contains only 35 per cent. of the best grown and most developed cocoa beans, and the Blooker flavor, aroma, and nutriment are entirely in the quality. This cocoa can be made right in the cup as soon as the water is boiling. It is not a ready made mixture, but just an excellent cocoa prepared in the most scientific way."

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Runkel Bros., of New York City, manufacturers of chocolate and cocoa preparations, offer the following in connection with their Runkel's cocoa: "Whether you are planning an extended cruise or just a short day's outing, the problem of provisioning your yacht is one that should receive your very careful consideration. Yachtsmen of experience have learned how to avoid any unpleasant disadvantages of a careless selection of foods. The food they choose must have three prinicipal qualities: It must be pure and wholesome, it must be of highly condensed nourishment, and it must be tasty and palatable. Good cocoa is such a food, and you will find that Runkel's combines all the required qualities in an almost ideal way. Supplied in a neat, handy tin, it takes up practically no space in the larder, and it is so easy to get ready, so smooth and thoroughly satisfying that every one comes back for another cup. On cold or rainy days there is nothing like a cup of Runkel's hot cocoa, while on hot sweltering afternoons, the glorious relief of a glass of iced cocoa is like the nectar of the gods. On hot days or cold—whether to coax up an appetite or to still that keen hunger of the sea—Runkel's goes right to the spot."

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The Horlick's Malted Milk Co., of Racine, Wis., points to its well-known product as the most desirable beverage at meals or in between times: "The success and pleasure of an outing trip either on water or on land depends largely upon the commissariat, and nothing is so appreciated and helpful at times as the right beverage. Horlick's, the original malted milk, when served hot on a cold day, or cold on a hot day, is indeed 'the cup that cheers' in an invigorating, nourishing manner. Its use tends to prevent mal de mer, while a cupful taken hot upon retiring induces sound, restful sleep. Horlick's is rich cream milk combined with an extract of malted grains, partially predigested and reduced to powder form. It represents the maximum of nourishment with the least tax upon the digestive organs. A supply of Horlick's stored in the locker is always ready for emergency as it may be prepared in a few seconds by merely dissolving the powder in hot or cold water."

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When it comes to thirst quenchers of the bottle variety the **Clicquot-Club Co.**, of Millis, Mass., has the following story to tell: "Two of the most enjoyable things about cruising are getting up an appetite and thirst and then getting rid of them. Two of the least enjoyable are getting the meals ready and preparing beverages. If there is no hired cook, every man jack fights shy of the galley. If there is one place in the world where the bottle comes into its own it is aboard a motor boat. Not any bottle, however, but containers that bear the label of tried and true brands—for ten miles out to sea is a bad place in which to experiment. For this reason skippers can do no better than to stock up with Clicquot-Club ginger ale and perhaps some of the other Clicquot-Club beverages. Clicquot-Club ginger ale is an all-around favorite, and everybody from the captain down to the children can drink it with perfect safety, for it contains nothing but the cleanest and most wholesome ingredients. In addition, it quenches the thirst so quickly and delightfully that it makes a deep sea thirst a pleasure. Furthermore, it is stimulating to the stomach and mildly laxative, thus offsetting to a considerable degree the dangers of a dietary that is almost invariably deficient in fresh vegetables and fruit."

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The Sheboygan Mineral Water Co., of Sheboygan, Wis., specializes in Sheboygan ginger ale, mineral water and other bottled beverages which have their place in the ice-box of a motor boat. To quote the company: "Sheboygan beverages are not like everyday beverages, as they have a delightful nip without a bit of the burning bite commonly found. We have had twenty-five years' experience in manufacturing them, use the finest ingredients we can buy, employ the most modern and painstaking methods, and turn out products which cannot be surpassed in flavor, nip and delightfully refreshing qualities. Wherever, as in yachting, the water supply must be reckoned beforehand, Sheboygan beverages completely fill the bill. They are not too sweet and are thorough thirst quenchers. They come in 5¼-, 10-, 13½-, and 24-ounce bottles."

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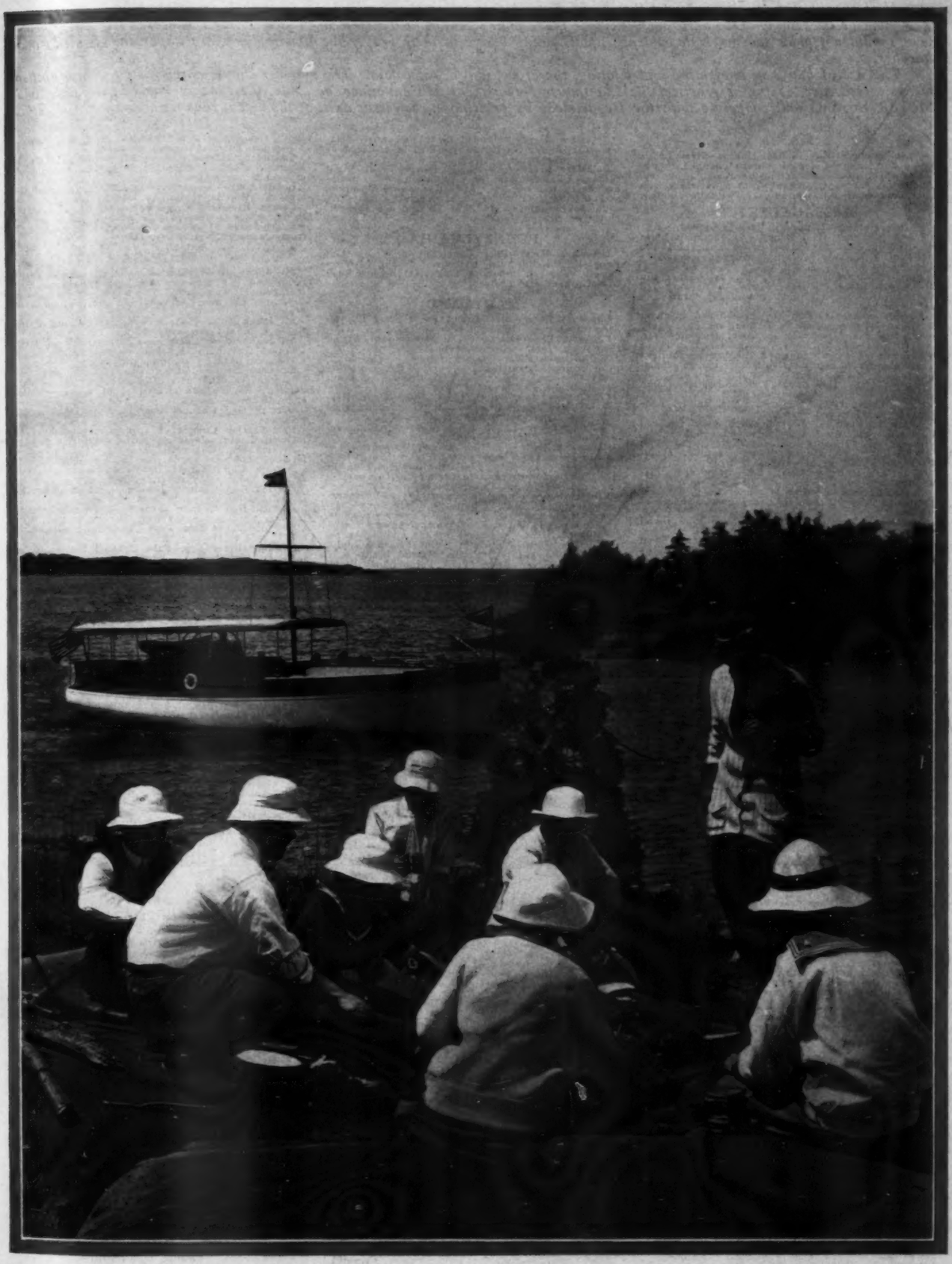
A delightful fruit which is not as widely known in the East as its merit deserves is the loganberry. The juice of this berry is made into a beverage by the **Pheasant Fruit Juice Co.**, of Salem, Oregon. In describing its good qualities the company declares that: "Due to the fact that Phes, the pure juice of the loganberry, will stand so heavy a dilution, the boat owner will find that he can carry a great deal more of this beverage than he could of almost any other fruit juices in the same allotment of space. Our product is simply the pure juice of the loganberry, but it is so concentrated that it will stand a dilution of two parts of water to one of juice when used as a beverage. Its new flavor is very appealing, and the many uses of Phes as a coloring and flavoring ingredient should make it particularly interesting to skippers of all motor boats."

The Landing Party Stops for Refreshment



Not the least of the joys of cruising is the occasional stop ashore for a meal around a cracking fire of driftwood. Meals served from the galley lack nothing in variety or quality of service, but there are times when the palate yearns for that extra flavor which only an unlimited amount of ozone and a touch of smoke can impart. Then we pack up our canned and bottled edibles, seek a natural fireplace, brush away the ants, let the fair sex do the rest of the work, and give ourselves over to unalloyed enjoyment of the gustatory art

Changes in Aids to Navigation

DURING the war it is but natural that a great many changes in the Government Aids to Navigation, buoys, lights, etc., will be necessary. Obviously many will be made which cannot be announced publicly. For this reason the motor boatman should not place too much dependence upon finding buoys in their proper location in the more important channels and harbors.

The use of buoys in navigating and piloting, therefore, will be uncertain. The mariner should check his position by other means. However, as far as practical the Lighthouse Department will announce, as usual, the changes made in the aids, and MoToR BoatinG *will coöperate with the Department by printing in each issue a list of the recent changes announced.—Editor.*

MAINE

West Penobscot Bay—Belfast Harbor—Steele Ledge Monument Light—Color of lantern changed.

Kennebec River—Stetson Rocks Buoy, 4, moved. About 100 yards 357°, changed to a 1st-class iron spar, and colored red and black, without number.

MASSACHUSETTS

Boston Harbor—Changes in buoyage made:

North Channel Gas Buoy, 8A, established, in about 6 fathoms of water; shows a flashing red light of 2 seconds' duration every 6 seconds, 3 candlepower.

North Channel Gas Buoy, 8B, established, in about 6 fathoms of water; shows a flashing red light every 6 seconds, flash 2 seconds' duration, 3 candlepower.

North Channel Gas Buoy, 8C, established, in about 6 fathoms of water; shows a flashing red light every 6 seconds, flash 2 seconds' duration, 3 candlepower.

North Channel Gas Buoy, A, established, in about 6 fathoms of water; shows a flashing white light every 6 seconds, flash 2 seconds' duration, 10 candlepower.

South Channel Gas Buoys, 1, 5, and 7, and North Channel Gas Buoy, 8, extinguished.

South Channel Gas Buoys, 2, 4, 6, and 3, temporarily discontinued.

Nantucket Sound—Pollock Rip lightvessel replaced on station, and the Relief lightvessel withdrawn.

Newburyport Harbor—Changes in buoyage made: South Pier Shoal Buoy, 7 A, 2d-class spar, established, in 2 fathoms of water.

Mid Channel Upper Buoy, PS, 35-foot spar, discontinued.

Boston Harbor—Reserved Channel Buoy, HS, established, May 1, 1st-class spar, in 5 fathoms of water.

Nantucket Sound—Stone Horse Shoal lightvessel temporarily replaced by Relief lightvessel.

Nantucket Sound Approach—Great Round Shoal lightvessel temporarily replaced by Relief lightvessel.

Boston Harbor—Hercules Wreck Gas Buoy, HS, established in 6½ fathoms of water, about 25 yards, 121° from wreck. Shows a fixed red light of 3 candlepower.

Boston Harbor—Naval Mooring Buoy, established: white, 2d-class, tall nun, in 9 fathoms of water.

Nantucket Shoals—Nantucket Shoals lightvessel temporarily replaced by Relief lightvessel.

RHODE ISLAND

Narragansett Bay Entrance—Rock discovered. On March 16, 1917, a rocky ledge having a least depth of 4 fathoms was discovered off Narragansett Pier. The ledge is about 200 feet long, northeast and southwest, and from 25 to 30 feet wide with depths varying from 4 to 6½ fathoms; is surrounded by depths of 10 to 12 fathoms. The sea sometimes breaks over this ledge in very heavy gales. A cork buoy was moored on the 4-fathom spot and an oil barrel about 60 feet farther southwestward.

Providence River—Pawtuxet Cove Range Lights established: each fixed red, of 60 candlepower, on a green post.

CONNECTICUT

Connecticut River—Saybrook Breakwater Light—Intensity increased: white light of 2,000 candlepower and red sector of 870 candlepower.

NEW YORK

New York Bay—Arthur Kill—Numbers removed from quarantine buoys, 1Q and 2Q.

Hudson River—Blue Star Wreck Buoy, HS, discontinued, the wreck having been removed.

Lake Ontario, South Side—Oswego Harbor—Changes in lights made:

Oswego Breakwater Light changed to fixed white of 2,000 candlepower, and name changed to Oswego Light Station.

Oswego Light discontinued, and Oswego Inner Light established in the vicinity of the tower, fixed red, of 50 candlepower, on post, 28 feet above water.

NEW JERSEY

Delaware River—New Castle Range Buoy, 6 N, temporarily removed.

New York Lower Bay Approach—Scotland lightvessel temporarily replaced by Relief lightvessel.

New York Lower Bay—North Hook Beacon Light Station—Light shown from new structure and intensity increased.

The light is of 4,500 candlepower, on skeleton tower, 44 feet above water on the range line, 1,040 yards 348° from Sandy Hook Lighthouse. No other change.

The old tower has been removed.

Raritan Bay—Conaskonk Point Shoal Gas Buoy, 3, established, and Conaskonk Point Shoal Buoy, 3, discontinued. Gas buoy, conical, with skeleton superstructure, showing a white light, occulted every 10 seconds, light 5 seconds, eclipse 5 seconds, of 10 candlepower, 10 feet above water, visible 4 miles, to be maintained on station from April 1 to December 15 of each year, and replaced by a 2d-class spar buoy during the winter.

Delaware River—Tinicum Island Range Rear Light Station—Intensity of light increased: white light to 2,000 candlepower and red light to 600 candlepower, without other change.

DELAWARE

Delaware Bay Approaches—Overfalls lightvessel temporarily replaced by Relief lightvessel.

Delaware River—Bulkhead Shoal Channel—Delaware City Light carried away. Will be replaced as soon as practicable.

Delaware River—New Castle Range Front Light Station—Characteristic of light changed to flashing every 2½ seconds, flash 0.5 second duration, and intensity of white light increased to 10,000 candlepower, and of red light to 3,000 candlepower. No other change.

PENNSYLVANIA

Delaware River—Pike Coal Barge Wreck Gas Buoy, HS, discontinued, the wreck having been removed. The tall nun buoy alongside the gas buoy has also been discontinued.

MARYLAND

Choptank River—Blackwalnut Point Shoal Light—Structure rebuilt and light re-established.

Patuxent River—Battle Creek Shoal Light—Structure rebuilt and light re-established.

Susquehanna River—Fishing Battery Light—Light to be changed, about June 14, 1917, to flashing white every 5 seconds, flash 1 second duration, of about 370 candlepower. No other change.

Chesapeake Bay, East Side—Poplar Island Narrows—Poplar Island Narrows Light—Structure rebuilt and light established in 7 feet of water.

Potomac River—Lynch Point Light—Structure rebuilt and light re-established.

Potomac River—Breton Bay—Postponement—Lovers Point Light moved about 125 yards 5° from its present position, to mark the outer end of the shoal, and color changed to fixed red, of 20 candlepower; Lovers Point Buoy, 6, discontinued.

Tangier Sound—Big Annemessex River—Postponement—Porpoise Point Light re-established and characteristic changed to flashing white every 3 seconds, flash 0.3 second duration of 30 candlepower.

Patuxent River—Structures rebuilt and lights re-established, without change: Point Patience Light, Petersons Point Light, Broome Island Light.

Choptank River—Blackwalnut Point Shoal Buoy, 1A, discontinued, the light having been rebuilt.

Choptank River—Warwick River—Warwick River Bouy, 12A, moved about 500 yards 63° from its former position, and established in about 2 fathoms of water to mark the dredged channel of Warwick River; color changed to black and number to 1.

Potomac River—White Stone Point Light re-established in new location, on shore about 1,675 yards 217° from its former position; a fixed white light, 60 candlepower, 16 feet above water on a white post, white oilhouse back of post.

VIRGINIA

Chesapeake Bay—Hampton Roads Approach—Willoughby Bank Gas Buoy, 17, to be temporarily discontinued, at an early date.

Rappahannock River—Postponement—Tarpley Point Shoal Light to be established, about June 15, 1917; to be a fixed red light, of about 20 candlepower, about 16 feet above water, on a red, 3-pile slatted structure, in about 2 fathoms of water, about 700 yards of 14° from the present position of Tarpley Point Shoal Gas and Bell Buoy, 6, which will then be discontinued.

Chesapeake Bay—Pocomoke Sound—Guilford Flats Light, carried away by ice. Will be rebuilt and the light re-established.

Pocomoke Sound—Postponement—Tunnel Island Spit Light to be established, about June 15, 1917; to be flashing white every 10 seconds, flash 1 second duration, of 30 candlepower, 16 feet above water, on a red 3-pile slatted structure in about 1 fathom of water, on the end of the shoal, 2¼ miles 305½° from Guilford Flats Light.

On the establishment of this light, Tunnel Island Gas and Bell Buoy, PS, and Tunnel Island Spit Buoy, 4, to be discontinued.

Potomac River—Mattox Creek—Mattox Creek Light—Structure rebuilt and light re-established. Temporary light discontinued.

Potomac River—Occoquan Bay and Creek—Spar buoys removed, and former float lights replaced by single pile structures, lights 15 feet above water.

Chesapeake Bay—Cherrystone Inlet—Cape Charles City Range Lights: black central bull's-eye painted on white daymark of each range light.

NORTH CAROLINA

Cape Fear River Entrance—New Channel Range Front Light—Temporary light established, fixed white, of 60 candlepower. The structure on which the light was maintained was damaged by collision. The regular lights will be re-established on a new structure as soon as practicable.

Seacoast—Frying-Pan Shoals—Frying-Pan Shoals lightvessel replaced on station and Relief lightvessel withdrawn.

SOUTH CAROLINA

Charleston Harbor—Characteristics of gas buoys changed:

Turn Gas Buoy, 10, changed to flashing every 5 seconds, flash 0.5 second duration.

Sumter Shoal Gas Buoy, 21, changed to flashing every 5 seconds, flash 0.5 second duration.

South Edisto River—Penwick Island Cut Light, established: A flashing white light every 3 seconds, flash 0.3 second duration, of 10 candlepower, 22 feet above water, on top of a white, square, pyramidal skeleton structure, with red rectangular daymark. The structure is in the marsh 25 feet from the northwestern bank of cut and 25 feet from South Edisto River.

St. Helena Sound—Characteristic of Combahee Bank Gas Buoy, 2 A, changed to flashing every 5 seconds, flash 0.5 second duration.

Charleston Harbor—Cooper River—Shipyard Creek Light, No. 3A, moved 30 yards 324° on account of erosion at the point.

Inside Route—Sewee Bay—Beacon, 11, reported destroyed. Will be rebuilt as soon as practicable.

Cooper River—East Side Shoal Buoy, 28, established: 2d-class nun, in 3 fathoms of water on the westerly edge of 16-foot shoal about 400 yards 36° from Oakdene Shoal Buoy, HS.

FLORIDA

St. Johns River Entrance—Obstruction—Yacht Aeldgytha has been removed and the channel at this point is now clear. The temporary lights and daymarks heretofore shown from the pontoon were discontinued.

St. Johns River—Buoy moved: Jetty Channel Gas Buoy, 6, moved 130 yards 58°.

St. Johns River Entrance—Characteristic of Jetty Channel Gas Buoy, 6, changed to flashing every 5 seconds, flash 0.5 second duration.

Suwanee Sound—Derrick Gap Channel and Suwanee River East Pass Channel—Corrections and depths. All beacons located about 17 yards from edge of cut:

Derrick Gap Channel Beacon, 2, is in about ¾ fathom.

Derrick Gap Channel Beacon, 1, is in about ¾ fathom, distant about 235 yards from Beacon 2.

Derrick Gap Channel Beacon, 3, is in about 1 fathom, about 525 yards from Beacon 1.

Derrick Gap Channel Beacon, 5, is in about 1 fathom, about 135 yards from Beacon 3.

Derrick Gap Channel Beacon, 4, is in about ½ fathom, about 375 yards from Beacon 5.

Derrick Gap Channel Beacon, 6, is in about ¾ fathom, about 535 yards from Beacon 4.

Suwanee River East Pass Channel Beacons, 2, 4, and 1, each in about ½ fathom.

Suwanee River East Pass Channel Beacon, 6, is in about ¾ fathom.

Suwanee River East Pass Channel Beacon, 3, is in about 1 fathom.

Gulf Coast—Big Marco Pass Light—Structure changed in color: The superstructure is white, the substructure remains black; without other change.

Gulf Coast—Caximbas Pass—Changes made in buoyage:

Caximbas Pass Entrance Buoy, 2, discontinued.

Caximbas Pass Sea Buoy, 2, 2d-class nun, established off the entrance, in 4 fathoms of water.

Caximbas Pass Entrance Buoy, 4, 3d-class nun, established at the entrance to the pass.

Caximbas Pass Channel Buoy, PS, 3d-class nun, established in the channel leading through the pass.

The two last-named buoys will be moved from time to time to mark the best water in the channel.

Gulf Coast—Withlacoochee River Entrance—Changes in buoyage made:

Withlacoochee Entrance Buoy, PS, moved 1½ miles 170° from its former position, into 3¼ fathoms of water.

East Shoal Buoy, 7, changed from 3d to 2d-class can, and renumbered 1.

The following buoys were discontinued:

Port Inglis Gas and Whistling Buoy, 1.
Bar Mid-Channel Buoy, PS.
Northwest Shoal Buoy, 1.
Southwest Shoal Buoy, 2.
North Shoal Buoy, 3.
South Shoal Buoy, 4.
Middle Mid-Channel Buoy, PS.
Middle Shoal Buoy, 6.
New Shoal Buoy, 5.
West Shoal Buoy, 8.

Gulf Coast—San Carlos Bay—Caloosa Bell Buoy, 2, replaced on station. Heretofore reported missing.

Gulf Coast—Tampa Bay—Mildred Wreck Buoy, HS, discontinued.

Gulf Coast—Anclote River—Beacons 30 and 32 rebuilt.

Gulf Coast—Cedar Keys—Seahorse Reef Gas Buoy, 1, established temporarily in 4½ fathoms of water, ½ mile 216° from Seahorse Reef Spit Bell Buoy, 3. Gas buoy is spar-shaped, shows an occulting white light every 10 seconds; light 5 seconds, eclipse 5 seconds, of 10 candlepower.

Key West Harbor—Main Channel—Key West Entrance Gas and Whistling Buoy, PS, to be established, about May 15, 1917, in place of Key West Entrance Gas Buoy, PS. The combination buoy will be cylindrical, with skeleton superstructure, and will show a flashing white light every 3 seconds, flash 0.3 second duration, of 350 candlepower, 16 feet above water.

ALABAMA

Mobile Bay—Pass aux Herons—Lights Nos. 4 and 8 temporarily exhibited: fixed red, of 10 candlepower, 16 feet above water, iron pile foundations being rebuilt.

LOUISIANA

Mississippi River Passes—South Pass—Changes to be made in aids to navigation:

Head of South Pass Range Front Light to be established; a fixed white light, of 40 candlepower, 30 feet above water on a white post with arm and rectangular slatted target, structure to be movable to mark best water, for entrance to South Pass from deep water in main river, about 1¾ miles from present Franks Crossing Light, with which it will form a range.

Franks Crossing Light to have a rectangular slatted target. Bearings will be published later.

Head of Passes East Jetty Light, to be moved

(Continued on page 56)

Yard and Shop

Important Meeting of Western Boat Builders

A very significant meeting was held at the plant of the Great Lakes Boat Building Corp., of Milwaukee, on May 1, under the direction of the officials of the Bureau of Construction and Repair of the Navy Department, who have charge of the construction of the 110-foot submarine chasers. The meeting was attended by Naval Constructor Furer; Chief Inspector John H. Wells and Inspector R. H. Hubbell of the U. S. Navy Department; Mr. Davenport, of the Dubuque Boat & Boiler Co., Dubuque, Iowa; Mr. Burger, of the Burger Boat Co., Manitowoc, Wis.; Herbert Toye, of the Matthews Co., Port Clinton, O.; Mr. Hartman, of the Hartman-Greilling Co., Green Bay, Wis.; Mr. Zickes, of the Rocky River Dry Dock Co., Rocky River, O., and W. C. Morehead, W. D. Beauvais and H. R. Chadwick, of the Great Lakes Boat Building Corp. The meeting was called primarily for the purpose of enabling Naval Constructor Furer and Chief Inspector J. H. Wells to explain some of the technical problems involved in construction. As a result of the conference, however, arrangements were worked out by the representatives of the various boat building companies for a co-operative purchasing organization to handle all the material required in the construction of the submarine chasers which will be built in the Great Lakes and Mississippi Valley regions.

For the first time in the history of the industry, an opportunity has been presented for the boat builders really to get together and become acquainted with one another. This situation is most gratifying, as heretofore there has been an entire lack of team work and confidence between builders even in the same section of the country.

The organization of the co-operative purchasing association reflects the application of modern business principles to a very practical problem. In time of war all forces should be mobilized so as to eliminate lost motion. Instead of each one of these western builders going into the market and obtaining prices and deliveries on the many hundreds of items of fittings that will be required in the submarine chasers, the work will be handled entirely by one department. Not only does this plan relieve the builders of a great deal of work; but it also will result in much lower prices, as the manufacturers will be asked to bid on the material for the entire number of boats building in the district rather than for the requirements of each contractor.

The Great Lages Boat Building Corp. has volunteered the services of its purchasing department to handle the work. One of the Government inspectors will be located at the plant in Milwaukee so that all supplies and equipment can be officially approved, thus eliminating any possibility of rejection of materials at a later date.

MoToR BoatinG's Patrol Series

"Taking the Trail" is the suggestive title of W. H. Foster's painting on page 14, of this issue, and the reader can vividly picture to himself the work of destruction which has been done before the arrival of the three 110-foot submarine chasers. Upon hearing the repeated S. O. S. of the stricken freighter they have rallied to her assistance, and one of them is seen picking up the survivors from the freighter's small boats, while the other two set off in pursuit of the Murderer of the Sea. A shell from the U-boat is seen striking near the bow of the chaser which is in the act of firing a return shot, and in the foreground we see the stalwart Reservists of the other Nemesis loading the bow gun with the projectile that is expected to write finish to the marauder's career.

Subsequent paintings in MoToR BoatinG's Patrol Series will illustrate other interesting activities of the Naval Coast Defense Reserve which is now so energetically whipping itself into fighting trim.

Economy of Solar Oil

The Missouri Engine Co., of St. Louis, Mo., has sent us a circular which tells an interesting story of the economy effected by one boatman through the use of a Missouri oil engine. The owner of this motor is Captain Elmer Thomas, of Hardin, Ill., who operates a passenger ferry between Hardin and Alton, Ill., taking nine hours to cover the round trip. Whereas in operating a 60 h.p. gasoline motor with which his boat was formerly equipped he had a daily fuel cost of $12, Captain Thomas states that with his 30 h.p. Missouri engine he maintains practically the same speed and has a daily fuel bill of only $2.50.

An Italian submarine destroyer, equipped with two 200 h.p. Model F 8 Sterlings, which attains a speed of 26 knots. She is fitted forward with a 47 mm. anti-aircraft gun

A handsome silver cup given by the Del Rey M. B. C. of Detroit, and won by the 32-foot Dollie B, powered with a 30-45 H.P. Model L Fay & Bowen. The cup was donated by the Mayor of Detroit, and carried with it the local championship of 1916

Hy-Watt Water-Proofness

The Hy-Watt Battery Co., of Cleveland, O., has informed us of several tests of Hy-Watt water-proof batteries made by owners who have been reluctant to admit that a battery could deliver its current while totally immersed in water. Two of the most interesting of these are as follows: A fisherman in Sandusky, O., not taking the water-proof guarantee at its face value, connected two lead wires of 18-foot length to the terminals of his Hy-Watt battery and trolled it under water for seven consecutive hours with the battery furnishing ignition for his motor the entire time. This battery is declared to be still in use. The other test was involuntarily performed by a motor boatman at Detroit, whose boat sank during a storm and was left under water for three weeks. When it was at length raised the motor was cleaned out and was immediately started on the Hy-Watt battery which had been under water for all that time.

Ever-Warm Safety-Suits Grow in Favor

We are informed by the Life Preserver Suit Co., Inc., of 11 Broadway, New York City, that the Ever-Warm Safety-Suit is constantly making new friends for itself, in both the motor boat and the merchant marine fields. The International Mercantile Marine Co., for instance, is recommending this life preserver suit to persons booking through its offices, while the suits are being placed for rental and sale on certain steamers to South America. It is also being supplied on units of the Coast Reserve squadron.

Sea Oam, a 22½-footer owned by George B. Nauman, of Ponce Park, Fla., and powered with a 6-10 h.p., 4½x5-inch, two-cylinder, Frisbie motor. The engine turns an 18x22-inch three-bladed propeller, and although the boat is of heavy construction gives a speed of 8 m.p.h.

Miss Miami, a one-step hydroplane which recently showed a phenomenal speed in her trial trips at Miami, Fla. She is owned by Glenn H. Curtiss, and is powered with a twelve-cylinder V-type Curtiss aeroplane motor. The engine is stated to develop an even 350 h.p.

Duesenberg Motors Corporation Forms

One of the most interesting events of the more recent past is the formation of the Duesenberg Motors Corp., of New York City, with a cash capital of $1,050,000 fully paid in. The new corporation succeeds and takes over the business of the Loew Victor Engine Co., of Chicago, Ill., and the Duesenberg Motors Co., of St. Paul, Minn. It will build on a commercial scale the highly efficient motors designed by Fred S. Duesenberg for marine, automobile and aeroplane service. A number of contracts already have been closed with some of the most prominent builders of motor boats, automobiles and aeroplanes, and production is already organized on quite a large scale. The engines manufactured by the Duesenberg Motors Corp., are stated to be essentially for those who can afford and demand the best. In each instance they are high powered, high speed and high efficiency power plants, and already a number of well-known yachtsmen have purchased Duesenberg motors for installation in their motor cruisers, patrol boats and seaplanes.

The marine models of the Duesenberg motors were brought out nearly two years ago by the Loew Victor Co., and have been in successful operation for some time, the volume of business on these motors having been large for better than a year. These marine engines are made in two sizes, a six-cylinder and an eight-cylinder 6¼ x 7¼-inch, developing from 200 to 400 h.p. These two engines will be manufactured in the Chicago plant of the Duesenberg Motors Corp., and this plant will do nothing else but produce these marine motors.

The stockholdership of the Duesenberg Motors Corp. is in the hands of men who are well known in business and financial circle of the United States. The officers of the new corporation are as follows: President, J. B. Harbeck; assistant to the president, E. P. Decker; secretary and treasurer, H. A. Wing; vice-president, Charles Stollberg; general manager in charge of manufacturing, Charles B. Page; general sales manager, N. G. Rost; purchasing agent, G. H. Beilstein; chief engineer, F. S. Duesenberg; assistant engineer, A. S. Duesenberg, assistant engineer and naval architect, Morris M. Whitaker; and assistant engineer, specializing in aeronautical division, F. G. Robinson.

New Evinrude Agencies

We are informed that the following distributors for the Evinrude detatchable rowboat and canoe motors have been appinted in the Maritime Provinces; A. R. Williams Machinery Co., of St. John, N. B., Ltd., St. John; the Saskatchewan Motor Company, Ltd., of Regina, and Revillion Wholesale, Ltd., Edmonton. These concerns will handle all agency appointments in their territories, and will carry a full stock of motors, parts, and accessories.

Since January 1, the following distributors have represented the Evinrude in Canada: A. R. Williams Machinery Co., Ltd., Toronto, Province of Ontario; E. Drolet, Montreal, Eastern Quebec: Capt. A. A. Sears, Victoria, Province of British Columbia. The sale of the Evinrude has been affected by the general prosperity now obtaining in Canada, and sales to date have already passed last season's mark.

Wisconsin Has New Test Room

The Wisconsin Motor Manufacturing Co., Milwaukee, Wis., has recently added a new test room which is electrically equipped throughout.

In it each test stand has an individual electric motor generator unit, and when an engine is completed in the assembly department, it is sent to the test room and connected up with the motor generator which acts as a motor and drives the engine until it is sufficiently free to allow it to be run under its own power. A uniform product is assured as each instrument board is equipped with meters which give the actual power required to drive the engine.

When the engines are sufficiently free, they are started and run under their own power, driving the motor generator as a generator. The load is then gradually increased until the motor develops the required power; whereupon it is run under full load for several hours.

The engine is then picked up with an electric crane and taken to the final inspecting department, where it is completely disassembled and all moving parts are given a thorough inspection and adjustment, after which the motor is again placed on the test stand and run for several hours. It is then ready to be shipped.

The large number of special motors built made it necessary to have a test stand which can easily be adjusted to any width of supporting arms and to any drop or rise. The motors are connected to the generator with an ingeniously designed coupling which is readily assembled in a few minutes.

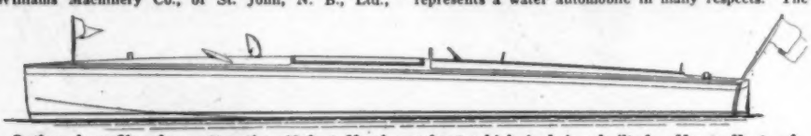
All the current that is generated by the generators during tests is reverted into the factory line and used to drive the machinery, giving the benefit of power which otherwise would have been wasted.

Osprey II, a V-bottom runabout, built by the Niagara Motor Boat Co., for J. Harvey Ladew, of Newark, N. J. She represents the last word in high-powered automobile-type runabouts

A 40-Foot V-Bottom Runabout

Henry Kart, of Buffalo, N. Y., will be the first yachtsman in his city to own a 40-foot runabout of the improved high-speed type. Mr. Kart has just placed an order with George Elliott, a local boat builder, for a 40-foot speeder of the V-bottom type from one of Wm. H. Hand's latest designs. The beam of the boat will be 6 feet 10 inches, and the draft 2 feet 6 inches. The very finest selected mahogany will be used throughout in constructing the craft.

This boat is one of the automobile type and truly represents a water automobile in many respects. The



Outboard profile of an attractive 40-foot Hand runabout which is being built for Henry Kart, of Buffalo, N. Y. She will be powered with a 200 h.p. Model F Sterling, and her speed is expected to be in the neighborhood of 38 m.p.h.

speed, for instance, is expected to be in excess of 38 m.p.h. The power plant selected is a 200 h.p. Model F. Sterling of the entirely enclosed type, equipped with electric starting and lighting outfit. Starting switch, pedal controls for reverse and go-ahead, and all gauges will be centered in a convenient place. This arangement, together with the automatic steering wheel, will make it very easy and convenient to operate and control the motor from the driver's seat.

Chicago's Permanent Boat Show

At last Chicago has a permanent boat show where any water fan may secure whatever he needs in the way of water craft and all that goes with them. The spacious showrooms of the Cullen Motor Co., at 112 West Lake St., contain nearly everything in the shape of motor boats, rowboats, canoes, marine engines, outboard motors, electric lighting plants and accessories—all of which have been selected from America's finest products by the process of elimination. The Cullen Motor Co., is the outgrowth of the old firm of H. E. Cullen & Co., which was founded several years ago in Wisconsin, with H. E. Cullen at its head. Last year the company's business assumed such proportions that it was necessary to incorporate, and Mr. Cullen was elected president and treasurer of the new company, and W. W. Stewart, general manager.

Probably the most important part of the Cullen exhibit is a complete line of the justly celebrated Mullins boats, built by the W. H. Mullins Co., of Salem, O., which for more than twenty years has supplied the boating public with dependable craft. In the Cullen showrooms to-day one will find a splendid exhibit of Mullins steel and wooden motor boats, rowboats and canoes. This line offers an interesting demonstration of the fact that there is a Mullins boat for every purpose.

List of Awards for 110-Foot Submarine Chasers

Barrett Shipbuilding Co., Mobile, Ala.	3
Blount, F. M., Pensacola, Fla.	4
Burger Boat Co., Manitowoc, Wis.	1
Chance Marine Construction Co., Annapolis, Md.	3
Camden Anchor-Rockland Machine Co., Camden, Me.	2
Dean, Chas. A., Alexandria, Va.	28
Dubuque Boat & Boiler Works, Dubuque, Ia.	2
Eastern Shipyard Co., Greenport, N. Y.	5
Elco Co., Bayonne, N. J.	16
Fry, L. E., Co., Clayton, N. Y.	4
Great Lakes Boat Bldg. Corp., Milwaukee, Wis.	2
Gibbs Gas Engine Co., Jacksonville, Fla.	5
Hodgdon Bros., East Boothbay, Me.	3
Hartman-Greiling Co., Green Bay, Wis.	2
Hildebrandt Dry Dock Co., C., Kingston, N. Y.	15
International Ship Building & Marine Engineering Co., New York City	10
Jacob, Robert, City Island, N. Y.	5
Kyle & Purdy, City Island, N. Y.	5
Lawley & Son Corp., George, Neponset, Mass.	28
Luders Marine Construction Co., Stamford, Conn.	5
Mathis Yacht Building Co., Camden, N. J.	15
McDonald, Alex., Mariner's Harbor, S. I.	4
Newcomb Life Boat Co., Richmond, Va.	5
Matthews Co., Port Clinton, O.	10
New York Yacht, Launch & Engine Co., Morris Heights, N. Y.	20
Rocky River Dry Dock Co., Rocky River, O.	2
Smith & Williams Co., Salisbury, Md.	2
Vineyard Ship Building Co., Milford, Del.	3
Wheeler, Howard E., Brooklyn, N. Y.	9
Charlestown Navy Yard, Boston, Mass.	20
New Orleans Navy Yard, New Orleans, La.	4
New York Navy Yard, Brooklyn, N. Y.	60
Norfolk Navy Yard, Norfolk, Va.	21
Stelz, Geo., College Point, N. Y.	10
Total	317

Gray Boat Builders' Catalogue for 1917

Although the Gray Motor Co., of Detroit, Mich., manufactures no boats of any kind, it publishes each year a large and expensive catalogue showing the stock models of a large number of prominent boat builders throughout the country. This is issued for the purpose of co-operating with the boat builder and rendering a service to prospective motor boat and engine owners of the greatest value. A great many motor boatmen are somewhat at a loss to know where they can secure a hull which meets with their requirements without going to the expense of having designs drawn and a special boat built for their purpose. By referring to the boat builders' catalogue, it is a ten to one bet that they can find just what they want among the many models and sizes of craft represented.

It is a distinct tribute to the Gray engine, and to the Gray Motor Co. that so many prominent boat builders use the Gray, and have adopted it as the standard power plant for their stock models. This is graphically shown by a glance through the many pages of the new 1917 boat builders' catalogue.

In this catalogue no description or prices of Gray motors are made except that a cut of several of their engines appear on the back cover. The inside of the magazine is devoted exclusively to illustrations and text of the various boats for which the Gray is suitable.

New test room of the Wisconsin Motor Mfg. Co. The bearings of the engines are first run in under electric motor power, and the engines are then tested by electric dynamometer

The display room of the Cullen Motor Co., of Chicago, Ill., showing representative models of Mullins boats. The firm also carries a very complete line of engines and parts

A Chinese Express Runabout

Carthay II, built by a Chinese carpenter for the Central Trading Co. of Shanghai, China, was designed by Wm. H. Hand, Jr., and is powered with a four-cylinder 65 h.p. Van Blerck motor, which gives a speed of 30 m.p.h.. The owners have written to the manufacturer that she is the "fastest boat by far in all China, Japan and the East. The engine has run ten months and is better than ever." This is a typical example of the wide spread use of American made motors. We are informed that two additional outfits have since been shipped to Shanghai, and that three such outfits recently went forward to Singapore. Australia and New Zealand have purchased a large number of Van Blerck motors, and it is understood that a large order will soon be placed by the Japanese Government for prompt delivery. Inability of firms in the Orient to purchase marine motors from Europe, which was their source of supply prior to the war, has thrown their inquiries to this country and the splendid showing made by American motors in the Orient will go a long way toward keeping this business in our hands after peace has been declared.

Perfectite, a Water-Proofing Compound

The Price Fire & Water Proofing Co., of Poughkeepsie, N. Y., has manufactured for many years the Perfectite compound which is declared to be unequaled for water-proofing motor boat tops, spray hoods, canvas boats, cushions or any other fabric desired.

A 28-foot Hutchinson runabout owned by Stephan Bonsal, of New York, and used by him among the Thousand Islands. She is powered with a 28-36 h.p. Model F Red Wing Thorobred motor, and has a speed of 26 m.p.h.

This compound is sold in a semi-solid form, and is thinned with gasoline, linseed oil or any other drying oil, as the user may prefer. On closely woven goods which are free of pin holes one gallon of gasoline to a pound or pound and a half of Perfectite will make the correct proportion for use, while on open goods two pounds of this preparation should be used to a gallon of liquid. One gallon of the liquid preparation is declared to be sufficinet for 100 square feet of canvas, while on light-weight closely woven goods it will go much farther. It should be applied to a dry surface so as to get the proper penetration, as it is intended to be absorbed by the fabric, making the latter water-proof through and through. It is declared to make pliable and increase the life of fabrics to which it is applied and to water-proof any material such as cement, concrete or stone, if put on according to directions.

Paint Concerns Form Merger

On April 19, 1917, a new company was organized under the laws of the State of New York, with the title of Devoe & Raynolds Co., Inc. This company on the above date acquired the companies of W. F. Devoe & C. T. Raynolds Co., of New York and Devoe & Raynolds Co., of Illinois.

The capital stock of the new company is $5,000,000 of which $1,000,000 is preferred and $4,000,000 is common, thus enabling the new company to increase its manufacturing facilities, and to inaugurate improvements that will give a better distributing service to its customers.

The general offices of the new company are at 101-103 Fulton St., New York, with offices and salesrooms in New York, Chicago, Buffalo, New Orleans, Kansas City, Denver, and Minneapolis; factories in New York, Brooklyn, Chicago, and Newark, N. J., and well stocked warehouses in Pittsburgh, Boston, Houston, and Savannah.

A Thousand Islands 28-Footer

There are a lot of islands on the beautiful St. Lawrence river. They sure were "landscaped by the Aeons and hedged with romance," too—to quote Herbert Kaufman. It's Earth's garden spot where tired business men, regular fellows and the Upper Ten all mingle in the summer in enjoyment of the magnificence of nature. The Thousands Islands are famous the world over, and naturally motor boating is one of the greatest recreations; in fact one cannot be in it without a motor boat, for most of the homes are located upon the islands and a boat is necessary to reach the mainland.

All of which leads up to our story of the beautiful 28-foot runabout recently turned out by Hutchinson Bros., boat builders of this district, for Stephan Bonsal, of New York City. This craft, shown in the accompanying illustration, has a speed of 26 m.p.h., and her power plant is a Model F 28-36 h.p. Red Wing Thorobred, manufactured by the Red Wing Motor Co., of Red Wing, Minn. The performance of this boat speaks well not alone for her power plant, but for the designers and builders of the craft too.

New Sterling Advertising Manager

The vacancy left by the sudden death of A. J. Mitchell, advertising manager of the Sterling Engine Co., of Buffalo, N. Y., is now being ably filled by M. E. Mutchler, who has been connected with the Sterling Company for the last four years. Mr. Mutchler stepped into his new position without a great deal of previous training in the advertising line, but his duties as traffic manager and assistant purchasing agent have well fitted him to take care of the details of the advertising managership. He seems to be all there with the rest of it—the initiative, the inspiration and the ability to express himself on paper—and we expect as much as we hope that he will acquit himself more than creditably.

A Remarkable Business Development

The illustration at the bottom of this page together with the insert of the tablet built over the door of the Bantam Ball Bearing Co.'s factory at Bantam, Conn., tells a story which can hardly be equaled in modern day business romance. Starting with a cash capital of $14.95, W. S. Rogers and Nellie M. Scott in 1905 founded the Bantam Anti-Friction Co., and in the intervening years have built up a business which has an annual output of $500,000, and is materially represented by buildings, machinery and materials to the value of $379,000. Needless to say Mr. Rogers who is now president emeritus of the company, is a man of astounding vigor and wonderful resource. He has gone ahead and done things.

Personalities

J. D. Termaat

J. D. Termaat

Mr. Termaat, the genial factory manager of the Universal Motor Co., of Oshkosh, Wis., is one of the veterans in the manufacture of gasoline motors. With L. J. Monohan he organized the Termaat and Monohan Co., many years ago, and produced the T. & M. two-cycle motor, which was one of the most successful two-cycle machines when that type was in vogue. Realizing, however, that the four-cycle would eventually have a more general appeal, Mr. Termaat and his associate produced the Universal 9-12 h.p. four-cylinder four-cycle engine.

Nature has endowed Mr. Termaat with qualities which fit him for the exacting duties of his position. That he finds time to cultivate outside acquaintance is attested by the numerous friends he possesses in the boating fraternity in all sections of the country.

O. C. Waterman

O.C.Waterman

Until his initiation into the electrical field two years ago Mr. Waterman had been in the steel construction and building game since his graduation as civil engineer from Purdue University in 1908. Since November of last year he has been connected with the Henricks Magneto & Electric Co., of Indianapolis, Ind., and has devoted a large share of his abundant enthusiasm to the study of motor boat lighting and its future.

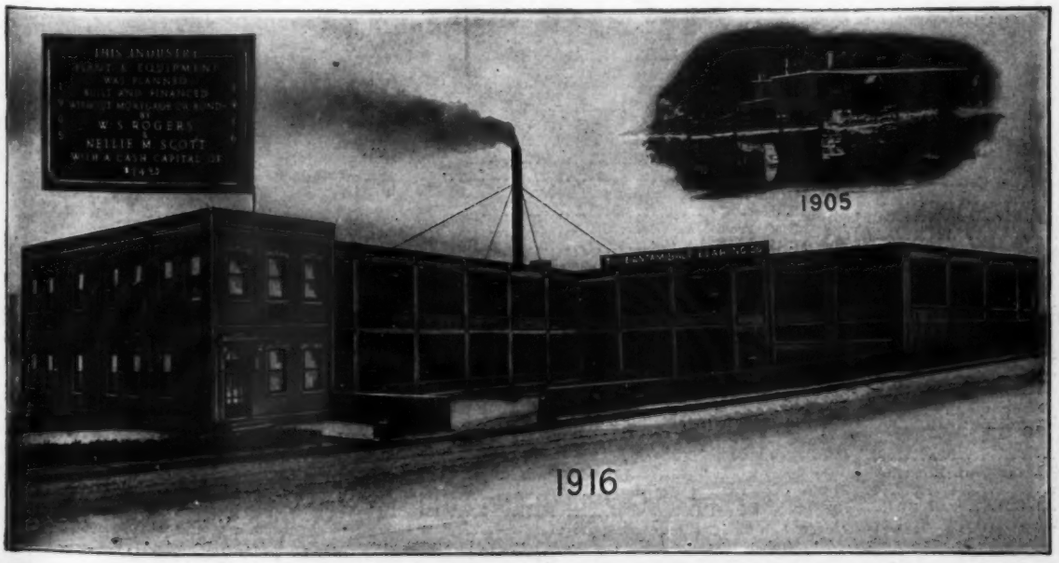
Having wormed this much information out of Mr. Waterman we sought to pry into his hobbies and personal likes and dislikes, wondering how he occupied his idle moments. But we found that he has no idle moments. His hobby is work and his recreation is business and more business—particularly that pertaining to motor boat lighting.

E. Drolet

E. Drolet

In Montreal, the names Drolet and Evinrude are synonomous. The reason for this is that E. Drolet is distributor of the well-known Evinrude detachable rowboat and canoe motors for Montreal and Quebec, and a live wire in the Canadian motor boat field. Up in his territory to think of Mr. Drolet is to buy an Evinrude, and to think of an Evinrude is to become a purchaser from Mr. Drolet. This is a perfectly simple proposition, and to duplicate it elsewhere it is only necessary to have a personality like this Evinrude distributor's, and a motor as satisfactory as the Evinrude.

Although still a young man Mr. Drolet has had over twelve years' experience in the motor boat business. In addition to a thorough knowledge of marine engines he is well versed in the designing of high grade motor boats and has more than a local reputation as a naval architect.



The spacious plant of the Bantam Ball Bearing Co., of Bantam, Conn. The insert in the upper left hand corner of the picture tells an amazing tale of progress for an eleven-year period

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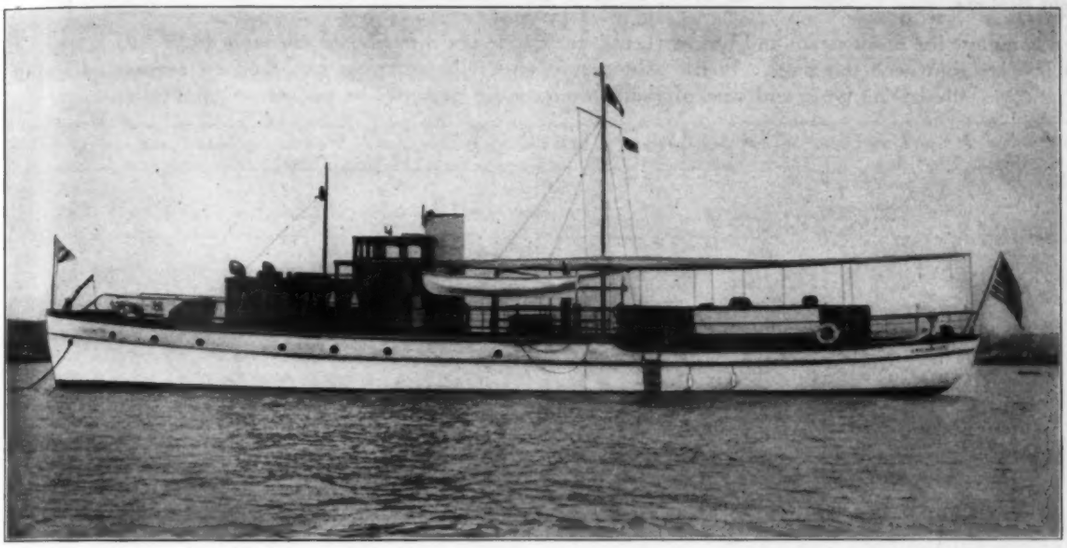

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$100,000 "Pride of the Pacific Coast" is Valsparred

Out on "the coast" they are strong believers in Valspar.

The mild, damp climate of the Pacific is extremely trying on varnish, but Valspar has proved itself over and over again to be perfectly capable of withstanding the most trying climatic conditions.

There is one kind of varnish that will keep its luster, defying the attacks of sun, rain, wind or moist air week after week and month after month, and its name is VALSPAR.

VALENTINE'S VALSPAR
The Varnish That Won't Turn White

The Ocean Shore Railroad of San Francisco, California, had never been able to secure a varnish that would last on the sides of their cars exposed to sea winds and ocean spray. Valspar now fills the bill.

Whatever kind of boat you own, whether sailboat, power-boat, canoe or rowboat, it can be kept beautiful at the minimum effort and expense by the use of Valspar. And remember, *Valspar has no substitute.*

Valspar can't turn white. No amount of water—not even boiling water—will give it the shabby look which water inevitably and invariably imparts to other varnishes sooner or later.

Corresponding perfection is to be found in *Valentine's Yacht White, Valentine's Yacht Black, Valspar Bronze Bottom Paint.*

To the man who is a crank about his boat we would like to send a little book of practical information, "How to Use Valspar on Boats."

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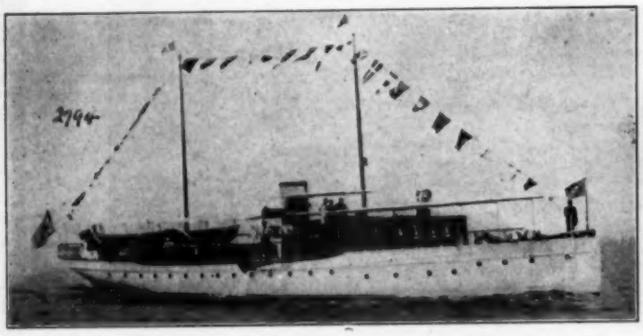
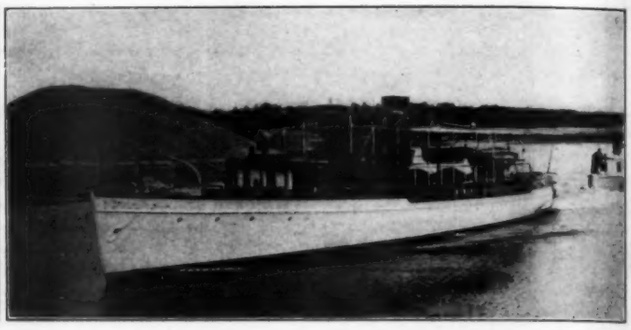
Cable—BROKERAGE

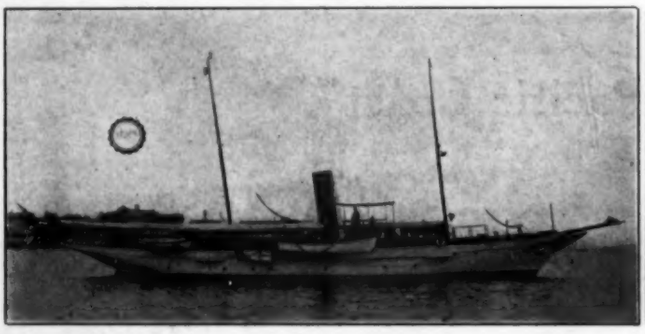
We have a complete list of all steam and power yachts, auxiliaries and houseboats available FOR SALE and CHARTER. A few are shown on this page. Plans, photographs and full particulars furnished on request. Catalogue illustrating types and sizes of yachts we have for sale will be mailed on application.



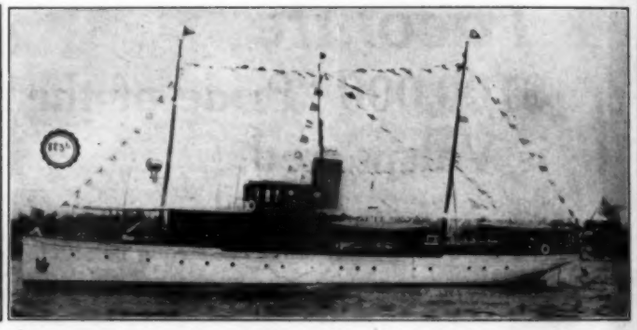
No. 2794—For Sale—Particularly able, modern twin screw cruising power yacht; 98 x 17 x 5.6 ft. Speed 13-15 miles. Deck dining saloon, three staterooms, two bathrooms, etc. Attractive price. Cox & Stevens, 15 William Street, New York.



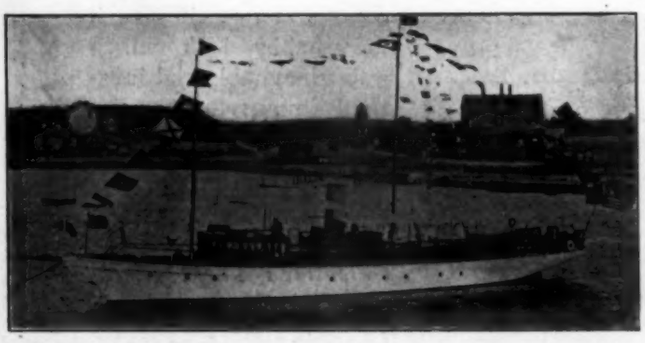
No. 2782—For Sale or Charter—Fast, twin screw power yacht; 99 x 14 x 4.6 ft. Adapted for patrol service. Speed up to 19 miles. Dining saloon, three staterooms, bath, etc. Cox & Stevens, 15 William Street, New York.



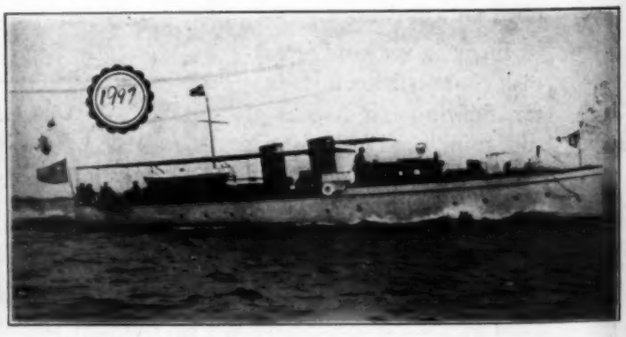
No. 1838—For Sale or Charter—Fast, able power yacht; 106 x 13.6 x 6 ft. Suitable for patrol service. Speed up to 17 miles; 300 H.P. Standard motor. Dining saloon, four staterooms, bath, etc. Cox & Stevens, 15 William Street, New York.



No. 883—For Sale—Unusually able power yacht; 94 x 18 x 6 ft. Suitable for patrol service. Speed up to 15 miles. Deck dining saloon, large main saloon, two double staterooms, two bathrooms, pilot house with large berth, etc. Electric lights; hot water heat. Cox & Stevens, 15 William Street, New York.



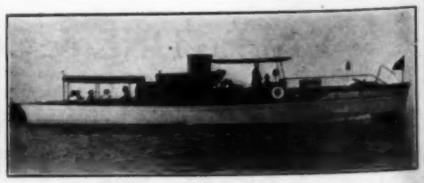
No. 573—Bargain—Roomy, twin screw cruising power yacht; 90 x 14.6 x 3.6 ft. Speed 10-11 miles. Dining saloon forward; large main saloon, three staterooms, bath, two toilets, etc., aft. Very economical to operate. Cox & Stevens, 15 William Street, New York.



No. 1997—For Sale—81 ft. fast, twin screw power yacht (adapted for patrol duty). Speed up to 15 miles. Exceptional accommodation. Fine seaboat. Cox & Stevens, 15 William Street, New York.

No. 3284—For Sale—72 ft. fast, twin screw power yacht (adapted for patrol duty). Speed up to 19 miles. Launched Fall 1915. Highest grade construction and power plant. Saloon, two double staterooms, bath, etc. Cox & Stevens, 15 William Street, New York.

No. 2690—For Sale or Charter—Bridge deck cruiser; 63 x 13.6 x 4 ft. Speed up to 12 miles; 50/65 H.P. "20th Century" motor. Accommodations include double and single stateroom, saloon, bath and toilet room, separate galley, etc. Finished in Honduras mahogany. Cox & Stevens, 15 William Street, New York.



No. 1005—For Sale—Fast twin screw power boat; 60 x 9 x 3.6 ft. Speed up to 17 miles; two 6 cyl. Sterling motors. Staterooms, saloon, etc. Cox & Stevens, 15 William Street, New York.

STANLEY M. SEAMAN

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(ESTABLISHED 1900)

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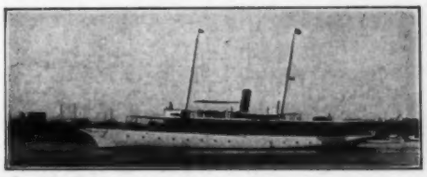
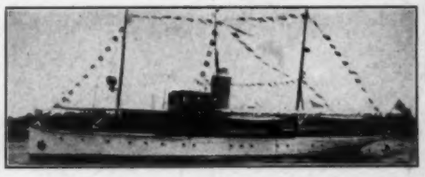
Send for Our Handsome Illustrated Yacht List. Mailed Free

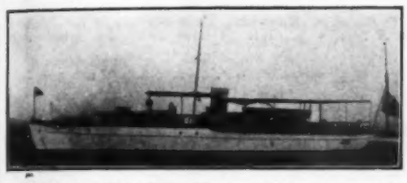
7482—The only large triple screw steel Gasoline Yacht available. Passed Government inspection. Immediate delivery. Stanley M. Seaman, 220 Broadway, New York.



5233.—Estate desires immediate sale of this fine 115-ft. steam yacht, offering 4 staterooms, 2 baths. Very economically maintained. Bargain to quick buyer. Stanley M. Seaman, 220 Broadway, New York City.



7920—95 foot Offshore Cruiser. In commission. Passed Government inspection. Immediate delivery. Stanley M. Seaman, 220 Broadway, New York.



8594—68 foot Twin Screw Matthews Cruiser. 2 double staterooms. Bath. In commission. Stanley M. Seaman, 220 Broadway, New York.

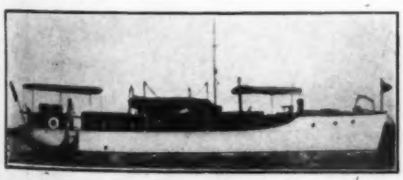
8612—Lawley Seagoing Cruiser 67 ft. o. a. Practically new. Finest yacht of type available. In commission. Stanley M. Seaman, 220 Broadway, New York.

8638—Fine opportunity to purchase 65 ft. high grade cruiser. Delivered in commission. Bargain. tanley M. Seaman, 220 Broadway, New York

8500—Exceptionally able 65 foot Cruiser Launched 1916. Speed 12 miles. Immediate delivery. Stanley M. Seaman, 220 Broadway, New York.

8659—High grade 60 foot Coast Cruiser. Very able sea boat. Stanley M. Seaman, 220 Broadway, New York.

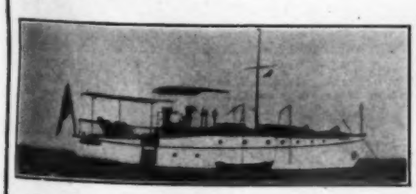
8660—Latest type 60 foot Cruiser, practically new. 2 double staterooms. Stanley M. Seaman, 220 Broadway, New York.



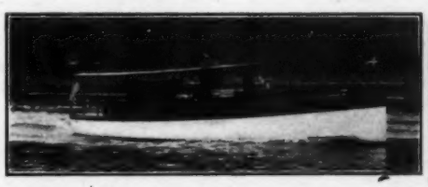
8379—60 foot Coast Cruiser. Very handsome interior. Low price. Stanley M. Seaman, 220 Broadway, New York.

8645—56 foot Seagoing Cruiser. Unusually heavily constructed. Bath room. Perfect condition. Stanley M. Seaman, 220 Broadway, New York.

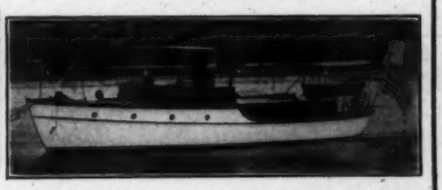
8643—Very handsome 55 foot Twin Screw Elco Cruiser. Speed 12 miles. In commission. Stanley M. Seaman, 220 Broadway, New York.



8646—One of the ablest 55 footers available. Cruised Atlantic coast extensively. Low price. Stanley M. Seaman, 220 Broadway, New York.

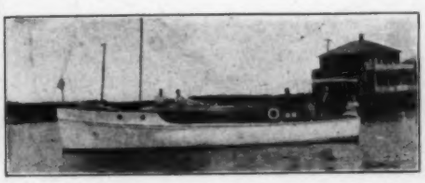


8654—The handsomest 55 foot cruiser available. Mahogany and teak construction. Speed 12 miles. Must be seen to be appreciated. Stanley M. Seaman, 220 Broadway, New York.

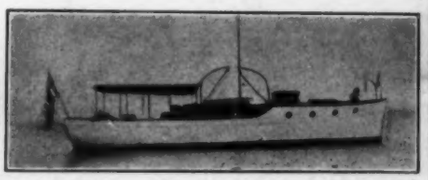


8151—Seagoing 52 foot Cruiser. Handsome interior. Fine accommodations. In commission. Stanley M. Seaman, 220 Broadway, New York.

8578—45 foot Express Cruiser. Launched 1916. Van Blerck motor, new 1917. Speed 20 miles. In commission. Low price. Stanley M. Seaman, 220 Broadway, New York City.



8644—42 foot Coast Cruiser. Practically new. Deck control. Fine accommodations. Stanley M. Seaman, 220 Broadway, New York.



8603—Very able 42 foot cruiser. Practically new. 2 staterooms. Bargain. Stanley M. Seaman, 220 Broadway, New York City.

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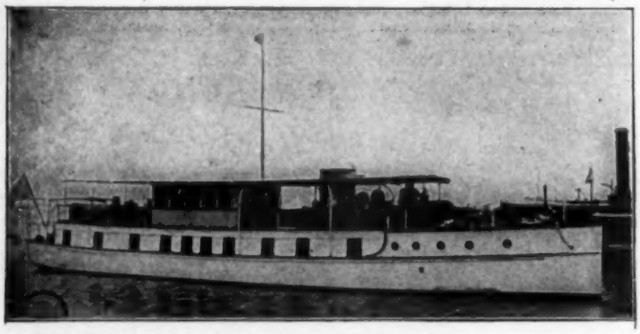
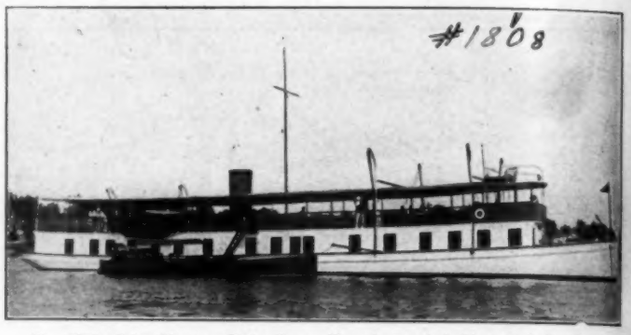
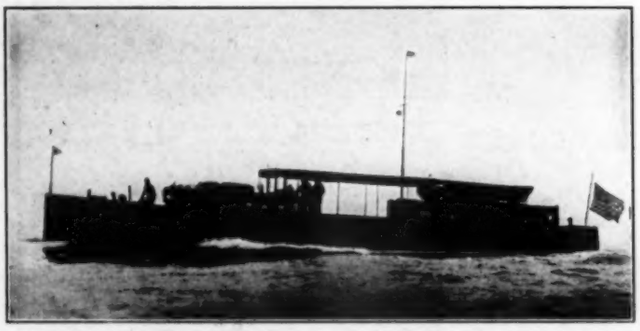


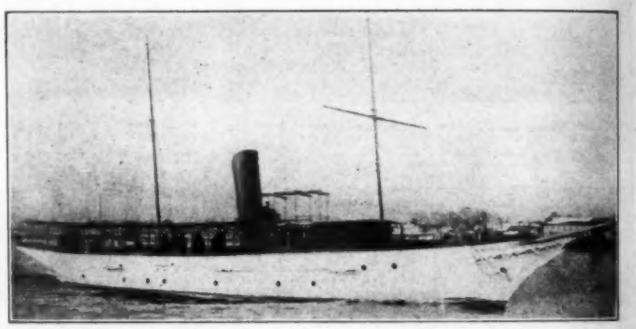
No. 1871—Sale—Charter—Modern motor houseboat. 95 ft. x 19 ft. x 3.3 draft. 4 staterooms, dining saloon, social hall, etc.



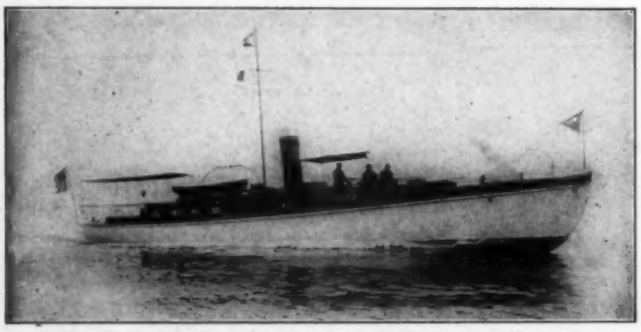
No. 1808—Sale—Charter—Twin Screw Houseboat, admirably suited for Southern waters, 125 ft. x 17 ft. 8 in. x 3 ft. 4 in. draft. 4 large staterooms, 2 bathrooms, saloon, etc.



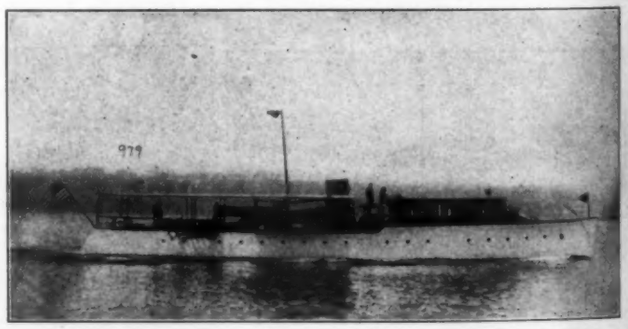
No. 7099—For Sale—Most desirable twin screw day cruiser available, 67 ft. 10 in. x 12 ft. x 3 ft. 9 in. draft. Designed by us; built 1911. Two 20th Century motors. Speed up to 14 miles. Very large cockpit.



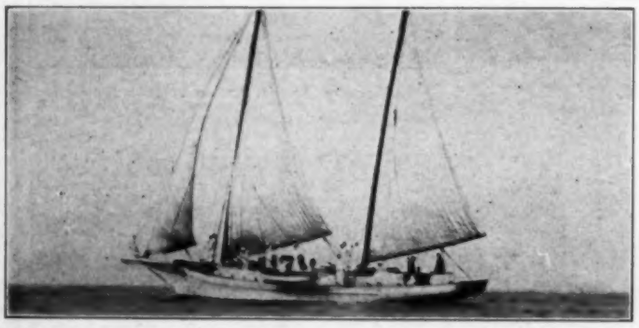
No. 7987—Sale—Charter—106 ft. cruising motor yacht; speed 13 knots; 4 staterooms, bathroom, main saloon, deck dining saloon, etc. Full equipment.



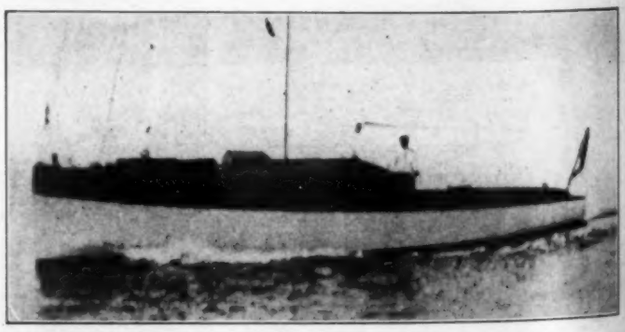
No. 7186—For Sale—Price attractive. Modern 90-foot fast cruising motor yacht, 300 H.P. Standard motor, speed up to 18 miles. Two single staterooms and two saloons. In excellent condition throughout.



No. 7996—For Charter—98 ft. desirable raised deck cruiser. Two 100 H.P. Standard motors; speed 14/16 miles. Three large staterooms, maid's room, two bathrooms and deck dining saloon, etc.



No. 1023—For Sale—Auxiliary Bugeye yacht, 82 ft. x 20 ft. 6 in. x 5 ft. 6 in. draught. 60 H.P. motor new 1916. 4 staterooms, bathroom, saloon, etc.



No. 7849—For Sale—At a reasonable price—Raised deck cruiser, 37 ft. x 8 ft. x 2 ft. 4 in. draft. 24 H.P. Standard motor. Excellent saloon, toilet room and galley. Large cockpit; good seaboat. Has always had the best of care. Full particulars from Tams, Lemoine & Crane, 52 Pine Street, New York.

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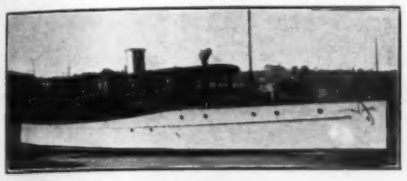
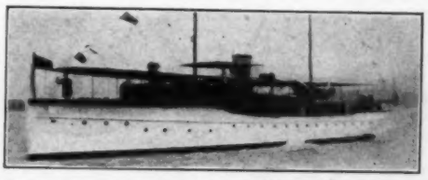
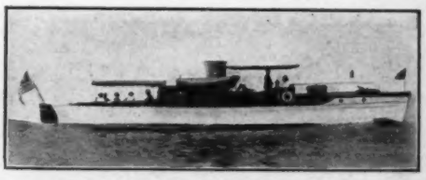


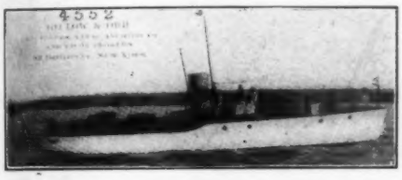
No. 5489—SALE—Twin screw express cruiser. Good seaworthy craft 72 feet long. Speedway motors, suitable for patrol work.



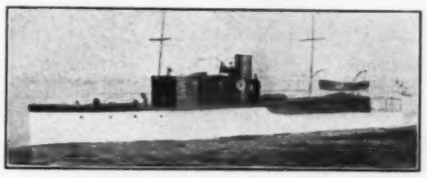
No. 4717—SALE—One of the handsomest 98 foot twin screw motor yachts afloat. Now on Great Lakes. Fine accommodations. Make good boat for scout duty.



No. 3182—SALE—60 foot twin screw express yacht. Speed up to 22 miles. Sterling motors. Good accommodations.



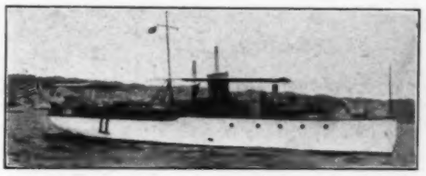
No. 4552—SALE—Attractive and seaworthy 62 foot bridge deck motor yacht. Would make good boat in Coast Defense Service. Worth investigating.



No. 5525—SALE—72 foot twin screw V-bottom express cruiser, 1916. In very good condition. Now in commission; deck strengthened for mounting of guns.

No. 5418—SALE—56 foot twin screw Elco bridge deck cruiser. Craig motors. Boat in fine shape. Inspectable New York.

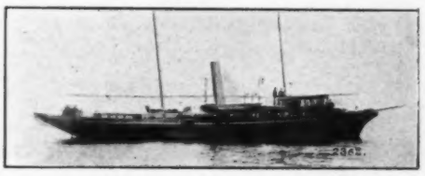
No. 5185—SALE—55 foot bridge deck cruiser, especially adapted for patrol service in southern waters. Very heavily built.



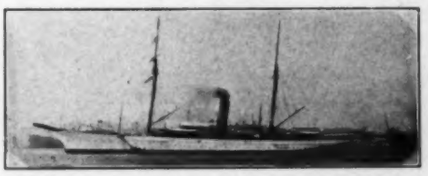
No. 4391—SALE—65 foot bridge deck motor yacht. Can be used successfully in patrol squadron. Price reasonable.

No. 2958—SALE—120 foot twin screw steam yacht. In fine condition. Speed up to 24 miles. Excellent boat for coast patrol work.

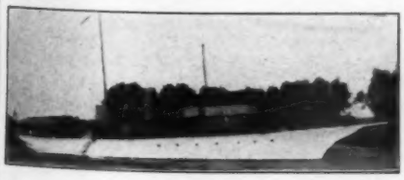
No. 5636—SALE—70 foot motor yacht. Strongly built. Can be enrolled in Patrol Service.



No. 2362—SALE—106 foot steam yacht. Heavily built and good boat for Coast Patrol Work.

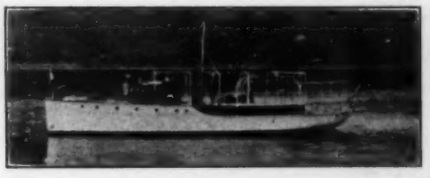


No. 2625—Sale and Charter—275 foot steel seagoing steam yacht—has made numerous long distance cruises—ten staterooms.

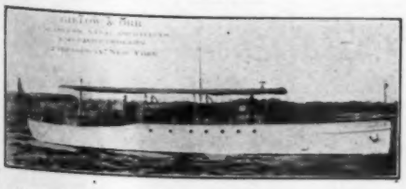


No. 3834—SALE—135 foot steam yacht. Inspected and passed favorably upon by naval inspectors. Can be enrolled in Squadron Patrol. Reasonable.

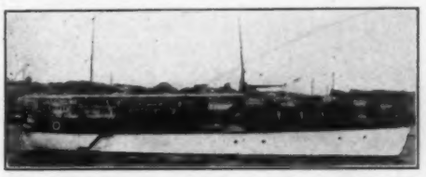
No. 5523—Sale—New 1916 motor yacht—66 foot—Standard motor—heavily built. Can be used in section patrol work.



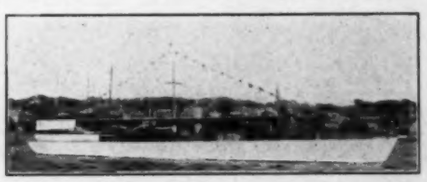
No. 5829—SALE—Attractive and seaworthy 65 foot motor yacht, Twentieth Century build. Fine condition.



No. 4689—SALE—Roomy and seaworthy 77 foot motor yacht—twin screw—sleeps fifteen.



No. 3957—SALE—75 foot motor yacht. Fine seaboat. Standard motors. Adapted for Patrol Work.



No. 3291—SALE—Twin screw fast steel yacht, 120 foot, Craig motors. Good for Scout work. Sleeps fifteen.

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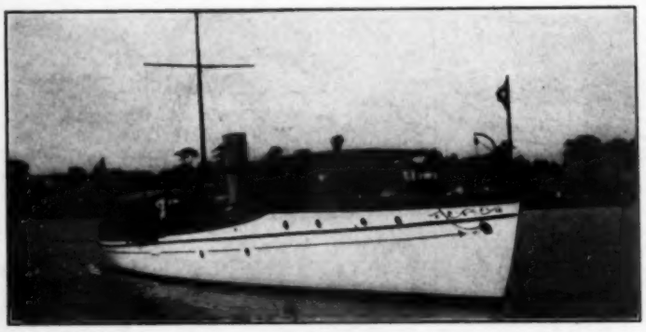
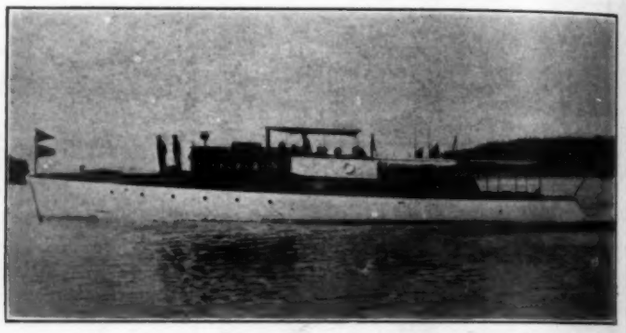
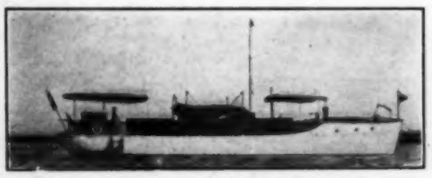


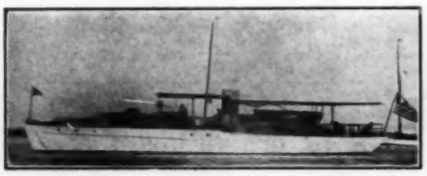
No. 1360—Seaworthy Cruiser, 100 x 17, large accommodations, new 6-cylinder Standard motor.



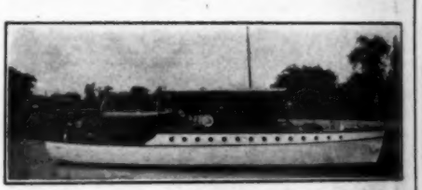
No. 2074—Twin Screw Power Yacht, 85 x 15, two 100 H.P. Standard motors, good condition.



No. 2072—In commission, Sale or Charter, attractive cruiser, 60 x 12.6, splendid motor and accommodation.

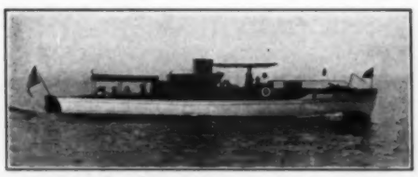


No. 1800—Handsome twin screw cruiser, 68 x 13.6. Standard motors, engine controls on deck.

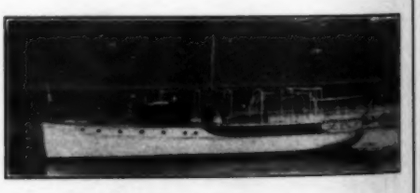


No. 1614—Raised Deck Cruiser, 57 x 13, Twentieth Century motor, large accommodation.

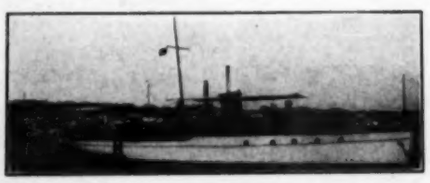
No. 1121—Raised Deck Cruiser, 60 x 12, forty horsepower motor, low figure.



No. 1625—Twin Screw 60 ft. motor, two new six-cylinder Sterling; speed 15 miles.

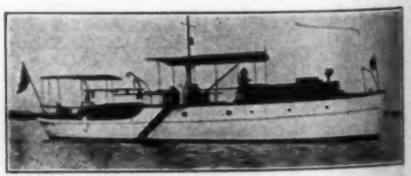


No. 1927—Modern Cruiser, delivered in commission, 65 x 13, recent build; Twentieth Century motor.

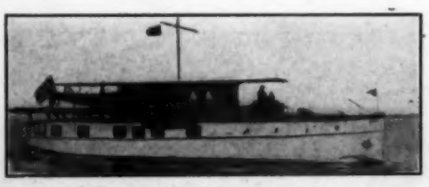


No. 1858—Raised Deck Cruiser, 65 x 12.6, Standard motor. Speed 12 miles, large accommodatipns. Charter considered.

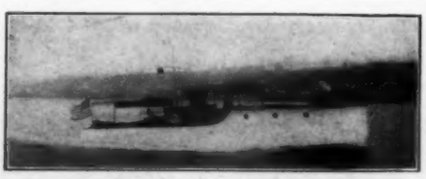
No. 2055—Able Cruiser, 58 x 11.4, Twentieth Century motor, price attractive.



No. 1956—Desirable cruiser, 52 x 11.6. Twentieth Century motor, everything in good condition. Price reasonable.



No. 72—Sale—Charter—Power Houseboat, 70 x 16, built 1916, first-class motor, attractive interior arrangement.



No. 2121—For Sale for Patrol Service, 50 x 10.3, speed 20 miles, built 1915, 8 cylinder Van Blerck motor.

No. 1267—Cabin Cruiser, 52 x 11, Elco Company build, Standard motor, attractive price.

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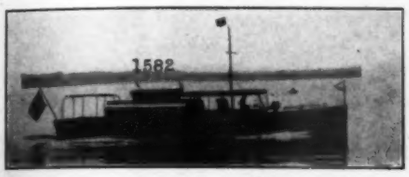
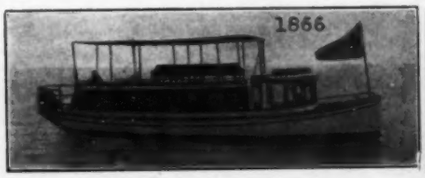
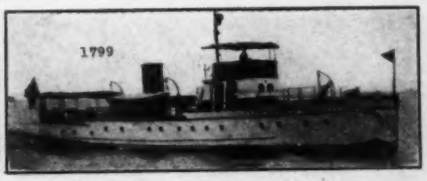


No. 1582—50 foot fast day cruiser. Speed 19 to 21 miles.



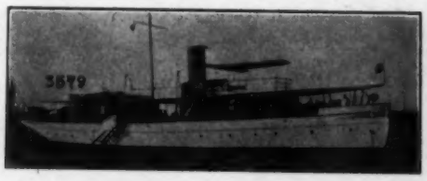
No. 1866—45 foot passenger launch. New engine installed 1916. Speed 10 miles.



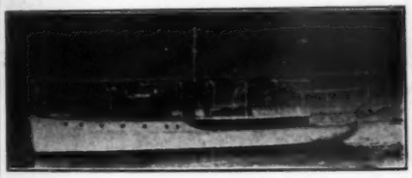
No. 1799—95 foot seagoing oil burning yacht. Good accommodations. Speed 14 miles.

No. 1441—60 foot twin screw express cruiser. Stateroom and saloon. Speed 15 miles.

No. 4141—95 foot auxiliary keel yawl. Three staterooms, two berths in saloon, two baths, 55 H.P. Sterling Motor. Speed 8 miles.



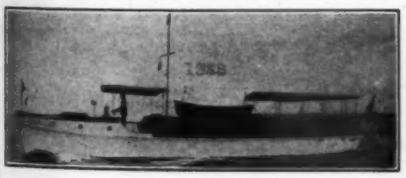
3579—For charter, 112 foot steam yacht. Four double staterooms. Two baths, dining saloon, music room, etc.



No. 1679—65 foot cruiser. Two staterooms, two berths in saloon, bath, etc. Speed 12 miles.

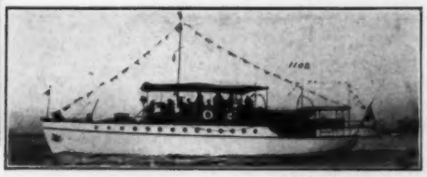
No. 1074.—50 foot cruiser. Staterooms and two berths in cabin. Speed 10 miles.

No. 3289—For Sale. The famous express steam yacht Arrow, 130 feet long, double planked mahogany. Two staterooms, large main saloon, dining saloon, bath, etc. Speed up to 30 miles. Suitable for submarine chaser.

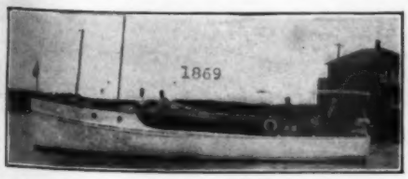


No. 1328—Sale or charter 60 foot cruiser. Double staterooms and saloon sleep five people. Speed 11-12 miles.

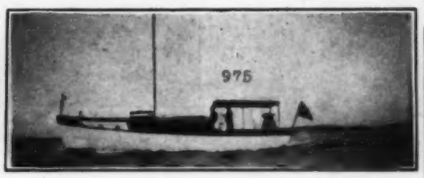
No. 1636—50 foot cruiser. Double stateroom, two extension berths in saloon, bath, etc. Speed 10 miles.



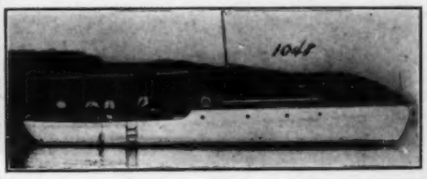
No. 1102—57 foot cruiser. Three staterooms, two berths in saloon. Bath, etc. Speed 12 miles.



No. 1869—42 foot cruiser. Double stateroom, two berths in saloon. Speed 10-12 miles.



No. 975—33 foot cruiser. Sleeps three people. Speed 9 miles.



No. 1048—57 foot cruiser. Double staterooms, three berths in saloon. Speed 10-12 miles.

No. 1381—46 foot cruiser. Double stateroom, two extension berths in saloon. Sleep 8 people. Speed 10-11 miles.

No. 1619—46 foot cruiser. Double stateroom, two berths in saloon, two in engine room, two toilets, etc. Speed 11-12 miles.

No. 4094—80 foot auxiliary yawl. Two double staterooms, two berths in saloon. Speed 8 miles.

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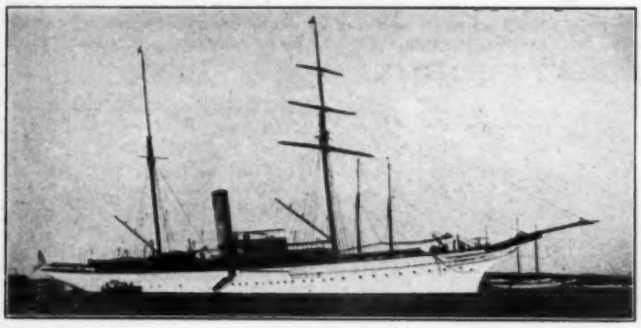
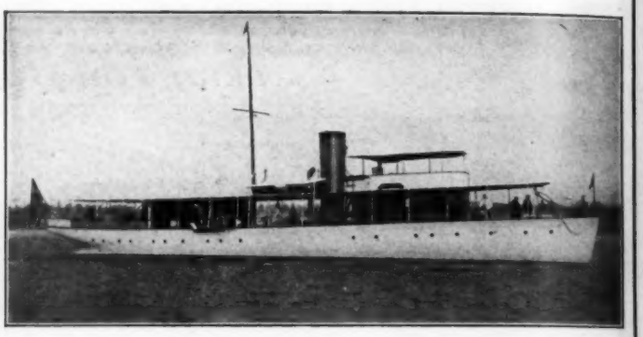
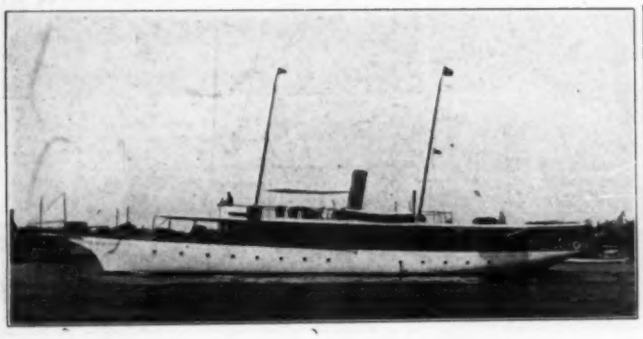


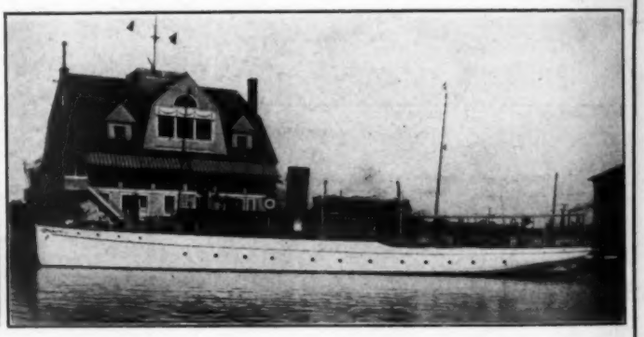
No. 5663—275 ft. Ocean-going Steam Yacht; one of the best vessels available.



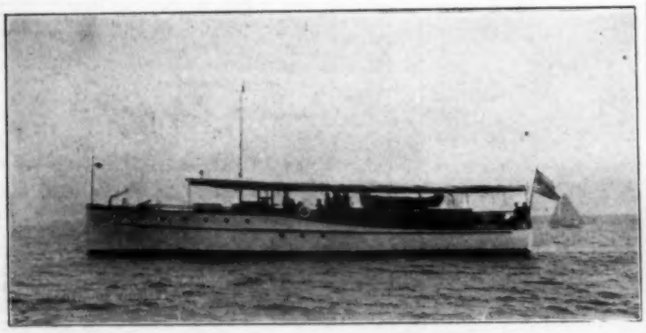
No. 1775—123 ft. Steel Steam Yacht; good speed, excellent accommodations, condition good as new.



No. 3847—115 ft. Steam Yacht; high class; offered by an Estate at low figure.



No. 6982—110 ft. Steel Yacht; good accommodations; high speed.



No. 4589—70 x 13 Gasoline Cruiser; recent build; one of the best boats of the size.

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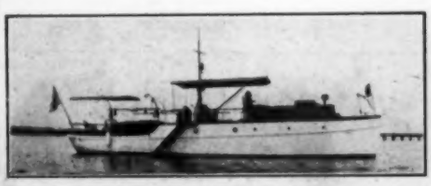

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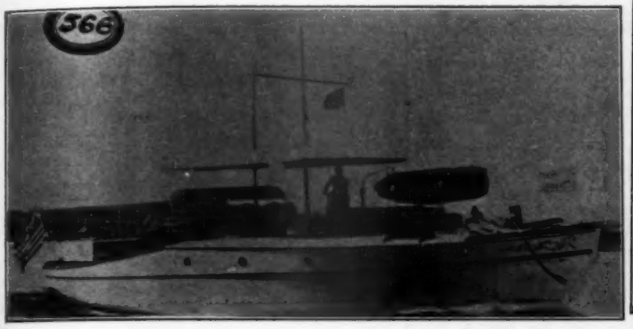
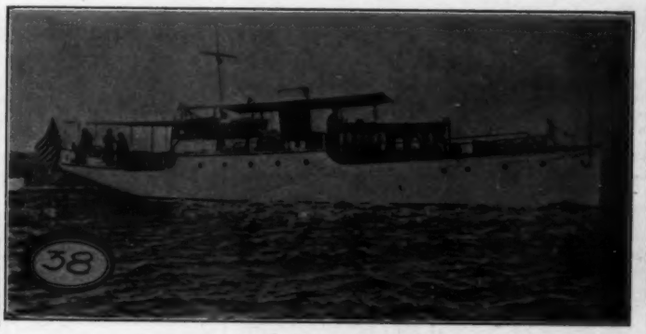
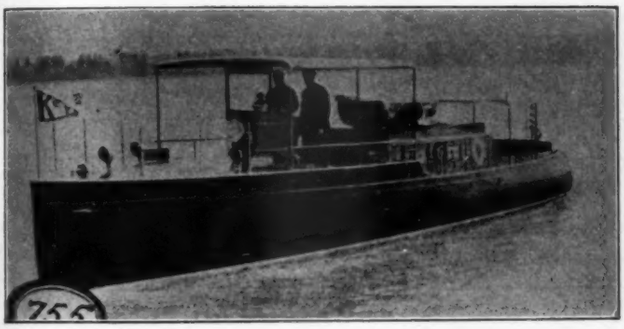


No. 566—For Sale—55 ft. twin screw motor yacht. Double stateroom. Large main saloon. **Two motors.**

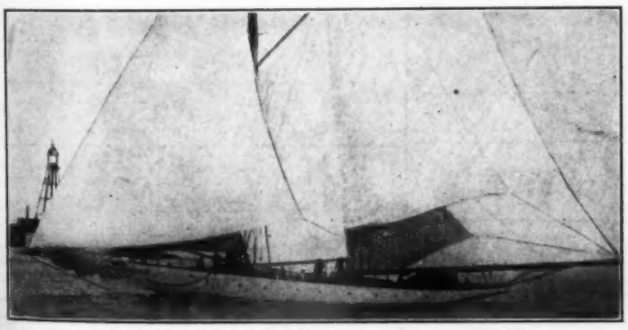


No. 38—For Sale—Exceptionally attractive 79 ft. power cruiser. Built in best possible manner in 1913. Winton engine. Large cruising radius. Speed 14 to 15 miles.

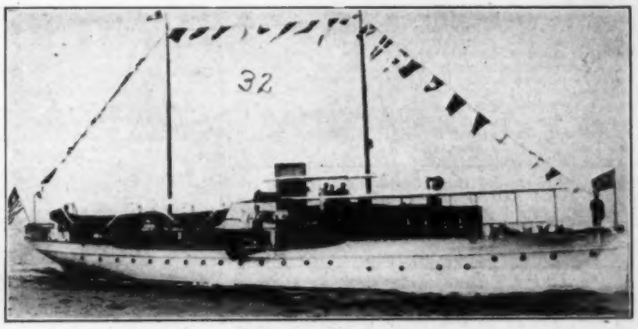


No. 755—For Sale—50 ft. fast express cruiser. Suitable for patrol boat. Best construction. VanBlerck motors. Speed 20 miles. Inspectable Great Lakes.

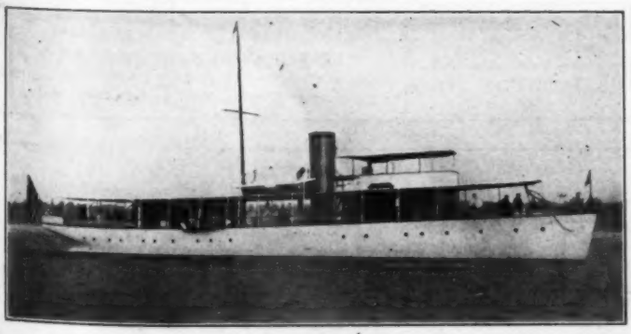
No. 679—For Sale—Very desirable steel steam yacht. 180' x 23' 7" x 9'. Recent build. Every modern convenience. 8 staterooms, 3 baths, etc. Dining and social hall on deck.



No. 71—For Sale—Bargain—99 ft. auxiliary schooner. Splendid accommodations for cruising and fast under sail or power. Full equipment.



No. 32—For Sale—Modern 98 ft. twin screw cruising yacht. Excellent accommodations and an unusually fine sea boat. Price attractive.



No. 606—For Sale—Modern 122 ft. steel steam yacht. Splendid accommodations. Two deckhouses. Five staterooms.

No. 231—For Sale or Charter—Very attractive steel steam yacht. 145 ft. x 18 ft. 4 in. x 9 ft. draft. Sleeps six to eight. Two bathrooms. Speed 18 to 20 miles. Superior boat; in splendid condition.

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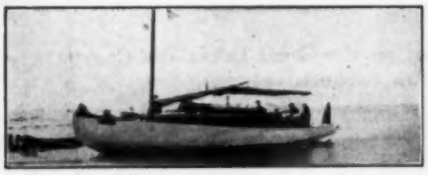
Before you buy or before you sell examine the exceptional buying and selling opportunities under the heading. They comprise the best offer of the month. Please mention MoToR BoatinG.



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Van Blerck E4, 65-85 H.P. Absolutely new. Not yet delivered from factory. Attractive price. The following used engines both in fine condition: Wolverine, 36 H.P., 3-cylinder with reverse gear, complete. Globe, 40 H.P., heavy duty, 4-cylinder with reverse gear. E. H. Allen, Box 1537, New Orleans, La.

FOR SALE—Twin screw motor yacht, 43 ft. long, beam 8 ft. 3 in., draws 2 ft. 9 in. Two 35-50 h.p. Peerless engines, speed about 12 miles. Boat in wonderful condition and must be seen to be appreciated. Price $4,000. Box 2, MoToR BoatinG.

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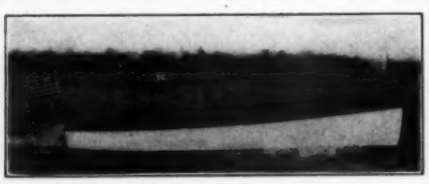
NEW 1917 ENGINES now ready for delivery. Catalog upon request. Agents wanted. Brown-Talbot Machinery Co., 19 Oakland St., Salem, Mass.



FOR SALE—32-foot ELCO CRUISETTE, 3-cylinder Lamb Engine. Overhauled and in excellent condition. Asking price $2,500. Anyone interested can communicate with William Colford, 97 S. Houston Street, New York City, telephone Orchard 3117. Present location, vicinity of New York City.

FOR SALE—Handsome 30-foot semi-speed runabout, practically new, mahogany finish; a real boat for rough weather; 4-cycle 4-cylinder Van Blerck engine, 40-50 H.P., Bosch dual, speed 21 miles, built by Kretzer Boat Co., New York. Charles T. Lamb, 91 Reid Avenue, Brooklyn, N. Y.

Auxiliary yawl, 35 x 14 x 3, with sails, rigging, toilet, ice box, galley, cushions, curtains, linen, stoves, etc., complete, twin screw seven horsepower each Eagle engines in splendid condition and will be demonstrated to buyer. Now being put in commission, ready for cruise. Full headroom extra large cabin. Must be seen to be appreciated—Selling because cannot use this season. Will charter to responsible party.
Address—WM. BRUNS (personal), care Bruns, Kimball & Co., 115 Liberty Street, New York City.

DON'T SCRAP YOUR ENGINES ON ACCOUNT OF SCORED CYLINDERS OR POROUS HOLES.
We repair them by our Patented Process-fusing a silver and nickel alloy electrically without warping or enlarging the bore. Write to our nearest plant. L. Lawrence & Co., New York, 546 W. 45th St.; Detroit, 1246 E. Jefferson; Chicago, 1522 Michigan Ave.; Newark, N. J., 292 Halsey St.

FOR SALE—"Iris II." Fastest Canadian Hydroplane, three step design, 26 x 6 ft. Mahogany throughout, seating capacity eight. 200 H.P. 8-cylinder Sterling Racing motor. Completely equipped, launched and tested out late last fall and conceded by experts the most perfect planning hydroplane afloat. Photos, price and full particulars upon application. Thos. Enright, 260 Brunswick Ave., Toronto.

WANTED—To purchase Amsler's Intergrater, Computing, area, moment, and moment of Inertia. Address E. J. Alpaugh, care Wright-Martin Aircraft Corp., 334 Fourth Ave., New York City.

FOR SALE—Solid mahogany, copper riveted runabout; length, 32 feet; beam, 5 feet; speed, 20 miles; modern high speed 4 cylinder, 4 cycle engine. Bosch magneto. Equipped with wicker furniture, automobile top, windshield, Warner Revolution indicator, light switches, etc. For quick sale will sacrifice for $1,150.00. F. J. Walker, Jr., 1482 Broadway, New York City.

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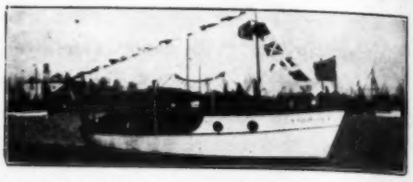
Rumpel's Cold Lunch Bag patents for U. S. and Canada for sale. Reason for selling, too much other business. J. Rumpel, Weston, Mo.

FOR SALE—Runabout (25-foot). A boat worth while for a cheap boat, but a first rate one. She is Sterling Powered and extremely well fitted. Speed 19 miles. We can heartily recommend her. In writing mention No. 63. Conodoguinet Construction Company, 168 W. High St., Carlisle, Pa.

FOR SALE—25-foot Mullins-Arrow. 35 h.p. Sterling Motor; electric starter; automobile top; searchlight, etc. $1,800.00. New, never in water. Box 1689, Atlanta.

FOR SALE—Practically new 1915 Model 23-foot Michigan Silver Streak. 20 h.p. Kermath Engine; self-starter; electric lights, extras. $600.00. Box 1689, Atlanta.

4-cylinder 18 h.p. engine—$30. Others cheap. Elmer Calkins, Petoskey, Mich.



FOR SALE—36 x 9 x 3 cruiser; Sterling engine; 10 miles; auxiliary sail; sleeps 8; full equipment. $1,800. Charles H. Briot, Monadnock Block, Chicago.

We have bought out the entire accessory business of the Bryant & Berry Co. and are overstocked on almost all brass fittings, such as chocks, cleats, flagpole sockets, stuffing boxes, stern bearings, deck plates, steering wheels, boat hooks, check valves, etc., etc. Write us at once and we will be glad to quote you very close prices until this surplus stock is reduced. Special quantity prices to boat builders, dealers and jobbers. Henry H. Smith & Co., 252 Jefferson Avenue, East Detroit, Michigan.

MOTOR BOAT WANTED.
40 ft. to 45 ft. long, with speed of 25 miles an hour. Must be good sea boat and in excellent condition. One with small shelter preferred. State particulars and lowest price. Address Box 5, MoToR BoatinG.

FOR SALE—40 Tents, 16 x 24 and 14 x 16, good condition, $13.00 and $15.00. 100 Folding Cots, very strong, $1.50 each. 9 and 6-inch port lights, $3.00. 2760 E. 27th St., Brooklyn.

FOR SALE—Exceptional bargain. Valve-in-head Erd motor, 25-35 H.P., 4 cylinders, 4-cycle, 4-inch bore, 5-inch stroke. Heinz low tension magneto, coil, Kingston carburetor, Joe's reverse. Used demonstrating. Run less than thousand miles. Overhauled, guaranteed by manufacturer perfect running order. Quick sale $225.00. E. M. Meek, 917 E. 62nd St., Chicago, Ill.

Thirty-six foot raised deck cruiser, practically new, equipped with Van Blerck 30 H.P.M. Beam 8 ft. Make us an offer. C. E. Kreger Co., 60 Biddle Ave., Wyandotte, Michigan.

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FOR SALE—GRAY MOTORS; IMMEDIATE DELIVERY.
Several models, also two Wisconsin model "Ultra," all new, never in service; delivery at once. Write for details of equipment and price. McCord Manufacturing Co., Detroit, Mich.

FOR SALE—Motor boat. Just the thing for camp on lake or river. 4-cycle engine, magneto and electric lights. P. O. Box 419, Worcester, Mass.

WANTED—Used Evinrude Rowboat Motors with Built-in-the-Flywheel Magneto. H. W. Jordens, 1069 Booth St., Milwaukee, Wis.

FOR SALE—Two Fairbanks-Morse Type G 12 H.P. Marine motors complete with Baldridge clutch and reverse. K W Coil, Schebler carburetor, Yankee muffler, used very little, installing large motors. Clark, Box 210, Leesburg, Florida.

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Blower runs by friction contact with engine flywheel. Whistle of brass, nickel-plated.
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All bronze composition. Suction lift 6 to 20 feet. A lifelong convenience.
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Men Who Have Developed Our Aerial Defenses

(*Continued from page 13*)

upbuilding of our aerial defenses. Among them were Senator George E. Chamberlain, the Chairman of the Committee on Military Affairs of the Senate, the sponsor of the Universal Training Measure, and Congressmen Julius Kahn, of California, and Murray Hulbert, of New York. Thanks to the support of these progressive men, the appropriations for aeronautics for the Army and Navy were increased to $18,000,000. Due to the efforts of these men it is considered that the development of our aeronautic resources and the training of aviators has been pushed a year ahead.

When they asked for an appropriation of $29,000,000 for the Army and $23,000,000 for the Navy last year, they were considered extremists. To-day, when the Navy is considering that it will spend $150,000,000 in aeronautics, and the Army is about to spend $50,000,000, they are being congratulated as men who had foresight.

Had Congress given a year ago the $56,000,000 for aeronautics which it has just allowed in the Deficiency Bill, and had the Army and Naval authorities invested such a sum judiciously we would now be in a position to take a hand in maintaining the Allies' supremacy in the air and in checking the submarine menace.

Now that large sums are to be spent for aeronautics and thousands of aviators are to be trained for home defense as well as to send to Europe, the aeronautic sections of the Army and Navy and the National Advisory Committee on Aeronautics are becoming important institutions. The Army and the Navy are co-operating in the development of aeronautics through the National Advisory Committee for Aeronautics, of which Dr. Charles D. Walcott, the Secretary of the Smithsonian Institute, is the executive head. Dr. Walcott, Brigadier-General George O. Squier, the Chief Signal Officer of the Army; Lieut.-Col. John B. Bennett, the officer in charge of the Aeronautic Division of the Signal Corps, and Lieut.-Commander John H. Towers, the veteran naval aviator, who has charge of aeronautics in the Navy Department, consider daily the problems connected with developing a substantial air service.

To carry out this plan, or part of it, will require the combined efforts, experience and advice of all the men mentioned and many others. The Army and Navy have been taking men who have had experience as fast as they could get them, and among them they have already taken over fifty members of the Aero Club of America, who are now serving the country in different capacities in the upbuilding of the air service. Howard E. Coffin, a member of the Advisory Committee of the Council of National Defense, and a member of the Board of Governors of the Aero Club of America, is now working with the other authorities in developing the plans for the development of our aerial defenses. The Advisory Committee of the Council of National Defense is one of the links between the official administration and the civilian organizations. All the members of the Advisory Committee are serving the Government without salaries, some doing as the workers of the Aero Club of America have been doing, actually paying even the expenses connected with the work they are doing for the Government.

With this combination of energetic efforts the United States ought soon to have a substantial air service.

* * *

Building a Flying Boat

(*Continued from page 29*)

either brass or copper, remembering always that it is better practice to use two smaller closely spaced screws or rivets in work of this character, than single large ones at longer centers. There is on the market a tubular copper rivet that is just the thing for fastening the aquatite knees on the sections and such other parts that will suggest themselves as the work progresses. In addition to metal fastenings every wood joining should be additionally secured by a proper application of Jeffery's or Briggs' marine glue. When this is correctly used, it alone has wonderful holding power and in addition creates a perfectly water-tight joint.

The cockpit has a seat laid upon the floors that extends full across the boat. It is low and upon it later will be placed two bucket seats of the regulation type, for pilot and passenger. There must also be aquatite flooring upon the bottom stringers in the cockpit, but this had best be omitted until after the controls are placed.

The gasoline tank may be made of light copper, but must have numerous fore and after splash plates and, in addition, a sump to which the fuel pipe leads. Its position is shown by the dot and dash lines on the plans approximately at frame No. 8. Twenty-five gallons is its capacity, which means that its dimensions must be 12 by 14 by 34 inches long. Cleats on the flooring encircling the base of the tank, with straps across its top, drawn down taut by small turnbuckles, assure the tank's remaining in place. Both the inlet and outlet should be in the top and, as the carbureter is fed by a Stewart Vacuum tank this problem is much simplified. The tank is small enough to pass through the hatchway and it need not be fastened permanently until after the craft is almost ready for the water.

The step is a 1/16-inch thick bronze plate extending across the bottom and following a fair line with the forward up-sweep of the bottom. It is supported by 7/8-inch wedge-like spruce shims, a method that allows a continuous bottom with all likelihood of a leak in this part of the hull removed. Each water-tight section must have a small boat drain for the removal of water, should any get aboard.

The interior should have at least three coats of first-class oil paint, each coat being well thinned and given plenty of time to dry. The outside should be treated the same way, both before and after the canvas covering is applied.

It may be well to remark that only the best of materials should be used for the hull construction, always bearing in mind that lightness, as well as strength, is a paramount consideration and that an ideal combination of the two will make a sturdy and an efficient air craft.

In a following issue of MoToR BoatinG a concluding article describing the superstructure of this flying boat will appear with drawing and hints on its construction and operation.

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The New York to Albany and Return Classic

Conditions for the New York Motor Boat Club's ninth annual long distance race from New York to Albany and return, to start Saturday, June 30, at 2 P. M., have recently been given out. They are as follows:

The course lies from the New York Motor Boat Club House, Hudson River at 147th Street, to the railroad bridge off the Albany Yacht Club House, Albany, N. Y., and return (disregarding government aids). Distance, 235 nautical miles.

The start and finish line is directly in front of the clubhouse and between the flagstaff and the committee boat flying two club flags and at night one red and one green light vertically placed.

The turning mark is the west pier of railroad bridge off the clubhouse of the Albany Yacht Club at Albany. Pier of bridge to be left on port hand.

The warning signal (1 gun) will be given at 1:50 P. M.; the preparatory signal (2 guns) at 1:55 P. M.; and the starting signal (1 gun) at 2:00 P. M. All boats must finish within 48 hours.

Rule V, 1917 A. P. B. A., will govern, and all competing boats shall be measured by the official measurer of the A. P. B. A., Frederick K. Lord, 120 Broadway, New York City, or by one of the following assistant measurers: F. W. Horenburger, New York Motor Boat Club; L. Huxtable, Colonial Yacht Club; C. O. Gunther, Columbia Yacht Club; R. M. Haddock, New Rochelle Yacht Club.

Only amateurs will be allowed on boats during the race. The committee will consider as ineligible those who derive their livelihood from sources directy connected with the operation, building or selling of boats or marine engines. Names and occupations of crews shall be handed to the committee in writing at least one hour before the start. A. P. B. A. requirements as to glass cabins, self-bailing cockpit, dinghy, etc., will be waived.

Explosive engine or engines operated by gasoline, kerosene, alcohol, or producer gas may be used. Any ingredient to increase the power of the fuel is prohibited. An extra supply of fuel may be taken on en route, provided the boat is not making headway through the water while so doing. The use of sails is prohibited.

Boats will be rated and handicapped according to the 1917 A. P. B. A. rules.

All boats entered must report to the regatta committee at the clubhouse not later than 9 P. M. on June 29 for inspection.

Entries close June 28, 1917, at 6 P. M., and must be in writing, accompanied by rating certificate. An entrance fee of $5 must accompany each entry, which amount will be refunded to those starting in good faith. The committee reserves all rights.

Protests (Rule XXIII, 1917 A. P. B. A.) to be handed to judge at finish line.

Suitable prizes will be presented to the winners on corrected time. There will be a first prize, a second prize if five boats start, and a third prize if seven boats start. A time prize will be awarded the boat making the best actual time. A trophy will be presented to all other boats finishing within the time limit.

Racers may stop or anchor at any place for supplies or repairs, but any boat proceeding except under its own power will be disqualified.

Each Captain must report the time of passing West Point Light, Poughkeepsie Bridge and Catskill Light in each direction, time of turning at Albany and time of finish, and this record must be handed to the Committee within twelve hours after finishing.

For other information apply to H. J. Allen, chairman of the regatta committee, 548 West 164th St., New York City. (Telephone Aud. 6810.)

Among the Clubs

Unrestricted Use of Motor Boats Approved

(*Continued from page 16*)

ever, certain areas where our fleet may be or where there may be mine fields which pleasure boats and all boats will be forbidden to enter. These are all well known locally, and the areas are advertised in every possible way.

To sum up: It appears to me that so far there have been no particular restrictions placed on the use of pleasure motor boats, except as regards passing through "Defensive Sea Areas" at night, and the necessity of being recognized and given permission to pass submarine nets.

(Signed) PHILIP ANDREWS,
Captain, U. S. N.,
Chief of Staff.

Seventh Naval District

At the present time, in this district, no restrictions are contemplated except at Key West and Tampa, and possibly later at Miami, Fla. At Tampa and Key West, defensive sea areas have been proclaimed by executive order of the President, and no boats should under any circumstances attempt to enter these harbors by other than the main or most usually used channels without first consulting the guard boat that will be found at the entrance. If permission is obtained from the guard boat to enter, the detailed sailing directions for that purpose will be given, which should of course be obeyed explicitly.

While motor boats running elsewhere will be under no restriction, they all are expected to heave to promptly at the summons of an armed vessel in order to facilitate their examination as much as possible whenever such may be desired. In the event that any motor boatman observes any vessels or cruisers that should in the opinion of the commanding officer be brought to the attention of the naval authorities, he should make every endeavor to reach the nearest port and communicate with the commandant of the district or such of his representatives as may be more conveniently located.

All arrangements are in a more or less tentative condition at present, and we will be glad to furnish you with other information which may be useful to you from time to time, if practicable.

(Signed) C. M. ELDER.

The executive order of President Wilson establishing defensive sea areas follows:

Executive Order Establishing Defensive Sea Areas

In accordance with the authority vested in me by section forty-four of the act entitled "An act to codify, revise, and amend the penal laws of the United States," approved March fourth, nineteen hundred and nine, as amended by the act "Making appropriations for the naval service for the fiscal year ending June thirtieth, nineteen hundred and eighteen, and for other purposes," approved March fourth, nineteen hundred and seventeen, I, Woodrow Wilson, President of the United States of America, do order that defensive sea areas are hereby established, to be maintained until further notification, at the places and within the limits prescribed as follows, that is to say:

Mouth of Kennebec River:
Outer limit.—Arc of circle with Pond Island Light as center, radius two (2) nautical miles.
Inner limit.—A line east and west (true) through Perkins Island Light.

Portland:
Outer limit.—Arc of circle center Portland Head Light, radius two (2) nautical miles.
Inner limit.—Line Portland Breakwater Light to west bastion Fort Gorges.

Portsmouth:
Outer limit.—Arc of circle with Whaleback Reef Light as center, radius two and one-half (2½) nautical miles.
Inner limit.—A line south (true) from southwest point of Clarks Island.

Boston:
Outer limit.—Line from Strawberry Point to Spouting Horn.
Inner limit.—Line west tangent Sheep Island to wharf on east side of Long Island. Line from wharf west side Long Island to large wharf west side of Deer Island.

New Bedford:
Outer limit.—Arc of circle center the east point of reef off Clark Point, radius distance to Dumping Rocks Lighthouse.
Inner limit.—Line between Butler Flats Light and Egg Island Beacon.

Newport:
Outer limit.—Arc of circle with Beaver Tail Light as center and radius of two (2) nautical miles.
Inner limit.—Fort Adams fog bell to north tangent of North Dumpling. East and west line through Plum Beach Light.

Long Island East:
Outer limit.—Line joining Watch Hill and Montauk Point Lights.
Inner limit.—Line joining Plum Island Light and Mumford Point.

New York East:
Outer limit.—Line joining Execution Rocks Light and east tangent of Huckleberry Island.
Inner limit.—A line north (true) through Whitestone Point Light.

New York Main Entrance:
Outer limit.—Arc of circle center Romer Shoal Light, radius six (6) nautical miles.
Inner limit.—Line west (true) from flagpole on wharf at Fort Hamilton.

Delaware River:
Outer limit.—East and west line through north end of Reedy Island.
Inner limit.—East and west line through Finns Neck Rear Range Light.

Chesapeake Entrance:
Outer limit.—Line parallel to that joining Cape Henry Light and Cape Charles Light and four (4) nautical miles to eastward thereof, and the lines from Cape Charles Light and from Cape Henry Light perpendicular to this line.
Inner limit.—Line parallel to line joining Cape Henry Light and Cape Charles Light and three (3) nautical miles to westward thereof.

Baltimore:
Outer limit.—Line from Persimmon Point to Love Point.
Inner limit.—Line joining Leading Point Range Light (rear) and Sollers Point.

Potomac:
Outer limit.—Line from Marshall Hall wharf to south extremity of Ferry Point.
Inner Limit.—Line from Riverview wharf drawn west (true).

Hampton Roads:
Outer limit.—Line from Back River Light to point one (1) nautical mile east (true) of Thimble Shoal Light; then south (true) to shore.
Inner limit.—Line tangent to end of wharf on west side of Old Point Comfort and Fort Wool.

Wilmington—Cape Fear:
Outer limit.—Oak Island Life Saving Station as center of arc, radius five (5) nautical miles.
Inner limit.—Line joining south end of Fort Caswell and Smith Island Range Beacon (Rear).

Charleston:
Outer limit.—Arc of circle with Fort Sumter Light as center, radius six (6) nautical miles.
Inner limit.—Line joining Charleston Light and Fort Sumter Light.

Savannah:
Outer limit.—Arc of circle with Tybee Island Light as center radius ten (10) nautical miles.
Inner limit.—Line across channel through southeast end of Cockspur Island.

Key West:
Outer limit.—Arc of circle with Key West Light as center, radius seven (7) nautical miles.
Inner limit.—Line joining south tangent East Crawfish Key and south tangent of Fort Taylor.

Tampa:
Outer limit.—Arc of circle with Egmont Key Light as center, radius six (6) nautical miles.
Inner limit.—Line tangent to southwest point of Mullet Key and east tangent of Passage Key.

Pensacola:
Outer limit.—Arc of circle center Cut (Front) Range Light, radius six (6) nautical miles.
Inner limit.—South (true) from east corner of dock at Navy Yard old dry-dock slip.

Mobile:
Outer limit.—Arc of circle with Fort Morgan Light as center, radius six (6) nautical miles.
Inner limit.—Fort Gaines to Fort Morgan.

Mississippi:
Outer limit.—Lucas Canal.
Inner limit.—Bolivar Point.

Galveston:
Outer limit.—Arc of circle with Fort Point Light as center, radius five (5) nautical miles.
Inner limit.—Line joining Bolivar Point and Fort Point Lights.

San Diego:
Outer limit.—Arc of circle with Point Loma Light as center, radius two (2) nautical miles.
Inner limit.—Line joining Beacons Nos. 3 and 4.

San Francisco:
Outer limit.—Arc of circle with center at middle point of line joining Point Bonita Light and Rock at Cliff House, radius four (4) nautical miles.
Inner limit.—Line from Bluff Point to Point Campbell on Angel Island and line from Quarry Point on Angel Island to extreme western point on Goat Island; also line from extreme western point on Goat Island to North Point, San Francisco.

Columbia River:
Outer limit.—Arc of circle with center three (3) nautical miles south (true) from North Head Light, radius three (3) nautical miles.
Inner limit.—Line from wharf at Flavel Tansy Point at right angles to axis of channel.

Port Orchard:
Outer limit.—Arc of circle, center Orchard Rock Spindle, radius two (2) nautical miles.
Inner limit.—Line from Point White at right angles to axis of channel to opposite bank.

Honolulu:
Outer limit.—Arcs of circles centers Diamond Head Light and Honolulu Harbor Light, radii nine (9) nautical miles.
Inner limit.—Line across channel at No. 7 fixed light.

Manila:
Outer limit.—Line through Luzon Point and Fuego Point.
Inner limit.—Line through San Nicolas Shoal Light and Mount Sungay.

The responsibility of the United States of America for any damage inflicted by force of arms with the object of detaining any person or vessel proceeding in contravention to regulations duly promulgated in accordance with this executive order shall cease from this date.

WOODROW WILSON.

The White House, 5 April, 1917.

Regulations for Carrying Into Effect the Executive Order of the President Establishing Defensive Sea Areas

Whereas, in accordance with section forty-four of the act entitled "An act to codify, revise, and amend the penal laws of the United States," approved March fourth, nineteen hundred and nine, as amended by "An act making appropriations for the naval service for the fiscal year ending June thirtieth, nineteen hundred and eighteen, and for other purposes," approved March fourth, nineteen hundred and seventeen, defensive sea areas have been established by my order of April 5, 1917.

Now, therefore, I, Woodrow Wilson, President of the United States of America, do hereby authorize and promulgate the following orders and regulations for the government of persons and vessels within the limits of defensive sea areas; which orders and regulations are necessary for purposes of national defense.

I. In the neighborhood of each defensive sea area entrances have been designated for incoming and outgoing vessels, including, in the case of areas across which more than one channel exists, an entrance for each channel. These entrances are described in Article X of these regulations in conjunction with the areas to which they respectively pertain.

II. A vessel desiring to cross a defensive sea area shall proceed to the vicinity of the entrance to the proper channel, flying her national colors, together with International Code number and pilot signal, and there await communication with the Harbor Entrance Patrol. It is expressly prohibited for any vessel to enter the limits of a defensive sea area otherwise than at a designated entrance and after authorization by the Harbor Entrance Patrol.

III. Boats and other craft employed in the Harbor Entrance Patrol will be distinguished by the union jack, which will be shown from a position forward; they will also fly the usual naval pennant. At night they may show a vertical hoist of three lights—white, red, and white, in the order named.

IV. On receiving permission from the Harbor Entrance Patrol to enter a defensive sea area, a vessel must comply with all instructions as to pilotage and other matters that she may receive from proper authority, either before or during her passage across the area; it is understood that only upon condition of such compliance is the said permission granted.

V. No permission will be granted to other than a public vessel of the United States to cross a defensive sea area between sunset and sunrise, nor during the prevalence of weather conditions that render navigation difficult or dangerous. A vessel arriving off a defensive sea area after sunset shall anchor or lie-to at a distance of at least a mile outside its limits until the following sunrise; vessels discovered near the limits of the areas at night may be fired upon.

VI. No vessel shall be permitted to proceed within the limits of a defensive sea area at a greater speed than five (5) knots.

VII. All matters pertaining to fishery and the passage of small crafts within a defensive sea area shall be regulated by the senior officer of the Harbor Entrance Patrol.

VIII. These regulations are subject to modification by the senior officer of the Harbor Entrance Patrol when the public interest may require; and such notification as circumstances may permit will be issued regarding modifications thus made.

IX. Any master of a vessel or other person within the vicinity of a defensive sea area who shall violate these regulations, or shall fail to obey an order to stop or heave to, or shall perform any act threatening the efficiency of mine or other defenses or the safety of navigation, or shall take any action inimical to the interests of the United States in its prosecution of war, may be detained therein by force of arms and renders himself liable to prosecution as provided for in the act to codify, revise, and amend the penal laws of the United States, approved March 4, 1909, as amended by "the act making appropriations for the Naval Service for the fiscal year ending June 30, 1918, and for other purposes," approved March 4, 1917.

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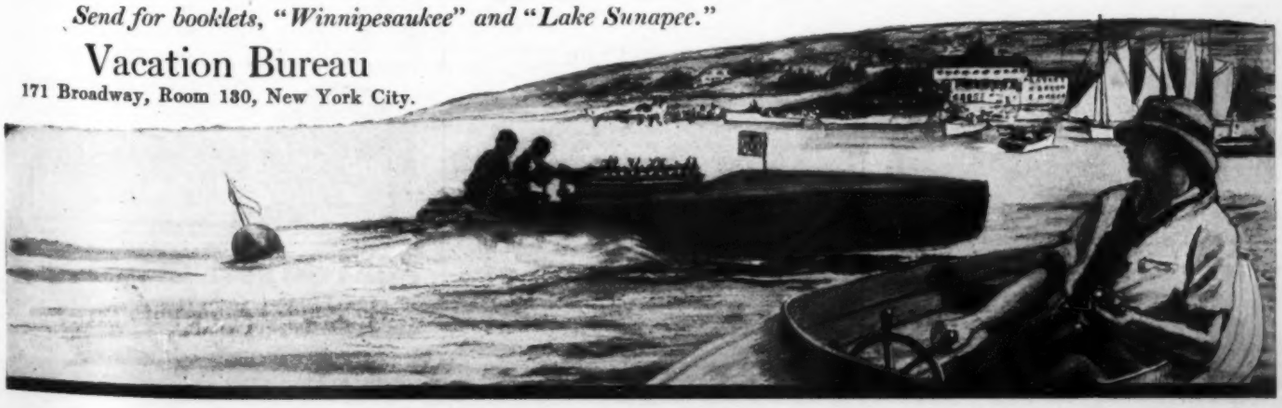

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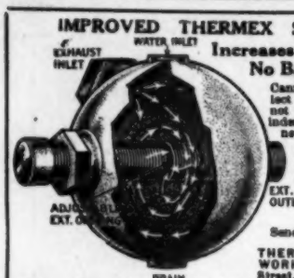

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Hundreds of Submarine Chasers

(*Continued from page 9*)

Some idea of the magnitude of the work may be gained from the following list of material used in the construction:

Five hundred and fifty gas stoves, 550 life boats, 2,200 sailing lights, 2,200 fire extinguishers, 25,850 incandescent lamps, 3,850 oil lamps, 12,300 canvas covers, 22,000 storage batteries, 109,450 feet of brass pipe, 550 search lights, 611,000 feet of manila line, 33,200 yards of canvas, 16,500 port lights, 1,650 sinks and wash basins, 11,550 ventilator cowls, 325,000 feet wire rope, 450,000 pounds paint, varnish, putty, etc., 979,500 bolts and nuts.

More than 3,000 men were employed in the assembling process, and 9,000 others engaged in preparing the material. Three thousand carloads of finished material were shipped from our Bayonne plant to Canada.

The interior layout of the boat provides a chain locker in the forepeak with crew's quarters immediately aft, including quarters for eight men, and a large ammunition room. The engine-room and galley are located amidships, and the officers' stateroom for two is positioned aft. On deck there is a chart-house forward, after which are a bridge wheel and engine telegraph. The superstructure was kept as low as possible, in order to reduce the boat's visibility to a minimum. The craft was given a fairly low metacentric height.

The power plant consisted of two six-cylinder Standard motors, having a bore of 10 inches and a stroke of 11 inches. Each unit developed 220 h.p. at 400 r.p.m. The motors were air-starting and reversing.

* * *

American Motors for British Chasers

(*Continued from page 11*)

The cast iron balanced exhaust valve is water-cooled also. The circulating water goes through a flexible rubber hose to a center channel in the hollow valve stem, thence down to the valve head and then up through the hollow stem outside of the inlet channel and out to the cooling manifold. This Standard valve has several distinctive features. The balanced piston has four grooves and twelve sprung steel piston rings. A set of springs at the top of the dash-pot chamber carries oil to the cage wall as the valve moves. The cage is almost instantly removable from the cylinder head.

Fuel is supplied by a little brass plunger pump on the engine driven by an eccentric on the vertical camshaft. This is constantly pumping gasoline from the float box to the vaporizer while the engine is running. The float box is the Standard regulating float cut-off type. It is fed from the main supply tanks, and the same level in the box is maintained through the automatic shutting off of the supply by the float cut-off. Any excess quantity of gasoline pumped to the vaporizer simply overflows back to the float box.

The vaporizer is of the Standard constant vacuum type which automatically regulates the mixture of gasoline and air at all engine speeds. When the throttle valve is open and the inflow of air accelerated a shutter which lies over the several tubes supplying the gasoline is automatically raised to uncover more gasoline spray tips, so that with a wide-open throttle all of the tips are supplying gasoline, while with a closed throttle gasoline is being fed from only a few tips.

The engine foundation is a cast iron, planed bed-plate, which has seven webs, each with square-sided slots cut into them to hold the main bearing boxes.

The engine frames supporting the cylinders are of turned, forged steel stanchions braced and counter-braced.

The cylinders are of hard, close-grained cast iron, cast singly and provided with substantial lugs for bolting to the steel stanchions. Cylinders are accurately bored and provided with ample water jackets.

The cylinder heads are independent castings of hard close-grained iron, with water jackets which receive circulation of water externally, independently of the cylinder. The cylinder head is recessed and carefully fitted into the cylinder.

The inlet valve, which is of steel, operates in a cage located in the center of the cylinder head, and is almost instantly removable.

The impulse of each explosion is absorbed by the rigidly supported crankshaft. The large main bearings, one between each two throws of the crankshaft, have square sides conforming with the sides of the bed slots, and a heavy flange on each end so that they can not be turned or gotten out of line after they are once set up. The bearing boxes are of highest grade phosphor bronze. The upper halves are held in place by the bearing cap, which fits into the bed slot, and which is held to the bed by steel studs, lock nuts and split pins. The bearings are scraped and fitted and lined up by hand, with oil grooves cut in. These bearings hold the crankshaft in perfect alignment without vibration under all shocks, and allow for the easy taking up of wear through re-scraping and the insertion of liners between the bed slot and the bearing.

The crankshaft is of forged nickel steel, of one piece from the solid billet, specially heat-treated, with six throws 120 degrees apart, which give complete balance to the rotating parts, and perfect division of impulse. The crankshaft is machined all over. The connecting rod bearings are of phosphor bronze, and in fact all bearings throughout the engine are of bronze and are adjustable. The connecting rod is of forged open-hearth steel, of one solid billet, of such a long length as to reduce to a minimum side thrust on the cylinder wall. The wrist pin is of nickel steel specially heat-treated, case-hardened and ground. This is held in place in the wrist pin hole of the piston by a square-head set screw which screws against its surface at one end, and with a tapered set screw fitting into a tapered hole in the wrist pin at the other end. The set screw in turn is locked with a split pin so that it cannot turn.

The piston is of hard, close-grained cast iron, carefully turned and ground to a finish on its diameter to fit the cylinder, ribbed and dished at the top for strength, and with radiation points on the underside of the head for cooling. The piston has six ring grooves, five above the wrist pin and one below, besides three oil grooves, one above and two below

(*Continued on page 56*)

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Carleton Generator

Especially adapted for marine service. Fully enclosed. Rated at 7 volts, 7 amperes. Driven by the engine and keeps any battery charged, furnishing current for ignition and for all lights, whether running or at anchor. Easily installed.

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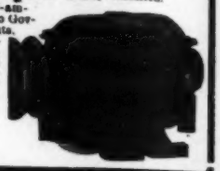

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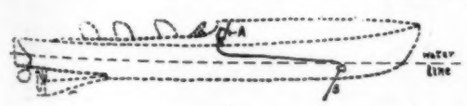

The Boatmeter is easily installed. The pressure orifice is installed on the hull forward, four inches or more below the water line. Only an eighth-inch hole is drilled in the hull. A cork gasket makes the installation absolutely and permanently water tight. An eighth-inch copper tubing connects the pressure orifice to the instrument.

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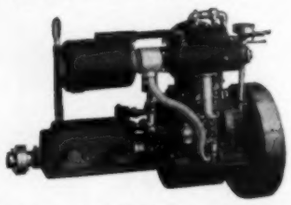

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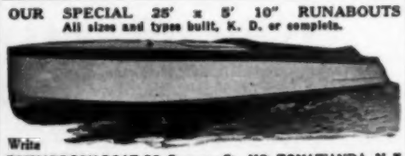

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The only fiber-filled life preserver approved by the U. S. Steamboat Inspection Service that supports the wearer's head clear of water. Adjustable to person of any size. Filled with the remarkably soft and buoyant Ilanasilk, the only fibre passed by the U. S. Steamboat Inspection Service for use in life saving equipment of all vessels.
We will gladly make special quotations when supplying complete equipments for Mosquito Fleet Craft.
Ilanasilk
Patrol Life Preserver, $2.75
UNIVERSAL SAFETY MATTRESS CO.
Dept. 7, 31 Nassau St., N. Y.

American Motors for British Chasers

(*Continued from page 54*)

the pin. Lubrication of the wrist pin is had through two diagonally drilled oil channels from the upper oiled groove of the piston to the center of the wrist pin bearing. The uppermost piston ring is of cast iron turned eccentrically with notched split and backing plate. The other rings are of split spring steel.

These are a few of the things which have been so molded and harmonized together into that perfect coördination and synchronism of parts to make this powerful machine the abject slave of the operator. Upon a bell from the pilot house the engine is brought to an instant, dead silent stop so that there is not a sound aboard the boat. And upon another signal from the quartermaster the boat is stopped full speed ahead or full speed astern so that she can almost literally be here, there and everywhere at the same time, as the Standard equipped motor patrol boats have shown.

The 550 submarine chasers are equipped with Johns-Manville fire extinguishers, an approved one-quart hand-operated extinguisher. The engineers in charge of the design and construction of these speed boats specified four Johns-Manville extinguishers for each craft, two machines in the engine-room, one in the pilot house, and one in the officers' quarters.

It is a signal tribute to the efficiency of the J-M fire extinguisher that it was designated for this service—and this choice is declared to establish the leadership of the "J-M" in the motor boat field.

Not the least interesting of the many subsidiary tasks which entered into the successful completion of the submarine chasers was that which fell to the lot of Cornelius Scott and his son Frank C. Scott, president and vice-president, respectively, of the Columbus Mfg. & Supply Co., of New York City. To their firm was given the contract for supplying all the canvas with which the Elco boats were equipped, and as the order ran into thousands and thousands of square feet, no small amount of business ingenuity was required to get the material out on contract time.

Upon receipt of the order the officials of the Columbus company were disturbed to find that their usual sources of supply for canvas in large quantities were closed—that is, there was no canvas obtainable from any of the jobbers in the city. Inquiry revealed the same condition to prevail in other big seaports, and Mr. Scott soon determined to go direct to a mill and purchase its entire output for a certain length of time. A mill having been found which could supply the high grade of goods required, Mr. Scott's troubles were still only partially behind him, for the contract, which was let on March 15, 1916, required that final delivery should be made on April 22 of the same year.

However, the stupendous task of manufacturing the canvas, treating it to make it water-proof, cutting it to the various shapes required, and finishing it was undertaken with undaunted vigor, and within less than six weeks from the signing of the contract the last piece of goods had left the Columbus company's shipping room. An idea of the amount of canvas required may be gained when it is known that the company supplied each of the 550 submarine chasers with canvas weather cloths for the bridge; steering wheel, engine-room telegraph, lifeboat, searchlight, and ventilator covers, as well as main and auxiliary engine covers, and canvas bottoms for the bunks. All told, there were 13,000 pieces, making a grand total of hundreds of thousands of square yards of canvas, yet this mammoth contract was put through without in any way disturbing the firm's prompt delivery on all special flag and pennant orders which came from the trade.

Since its inception in 1896 the Columbus company has done a great deal of war business, and has played its part in practically every shindy which has occurred in the last twenty years. Among the most important of its war orders prior to the Elco job were the supplying of the United States Government with tents in the Spanish war, and a big general consignment of canvas goods to Russia in 1915.

* * *

Changes in Aids to Navigation

(*Continued from page 36*)

northerly about 615 yards to west end of upper dam, to be fixed red, of 10 candlepower, 33 feet above water on a pile with red arm and topmast.

Coast—Calcasieu Range Front Light reported destroyed; will be re-established as soon as practicable.

TEXAS

Galveston Entrance—Galveston Jetty Light—Postponement—Characteristic to be changed, about June 30, 1917, to flashing every 5 seconds, alternately white and red, of 23,000 candlepower.

OHIO

Lake Erie, South Side—Fairport Harbor—Diamond Alkali Co. Outer Crib Light to be established at an early date, to mark new intake crib. A flashing red light every 5 seconds, flash 0.5 second duration, of 60 candlepower, 24 feet above water, on a skeleton steel tower. Crib is located about 1,440 yards east of entrance to harbor, in 20 feet of water. To be maintained by Diamond Alkali Co.

MICHIGAN

Lake Michigan, East Shore—Pentwater Pierhead Range Lights: color of both structures changed to red.

White River Pierhead: color of structure changed to red.

Lake Michigan, East Shore—Muskegon North Pierhead Light: color of structure changed to white.

Muskegon Pierhead Range Front Light: color of structure changed to red.

Muskegon Pierhead Range Rear Light: color of structure changed to red.

Muskegon Lake Light: color of structure changed to red.

Detroit River—Bar Point Shoal lightvessel station to be temporarily marked by Relief lightvessel, for a period of about 30 days following the opening of navigation. The relieving vessel is a steamer with tubular masts with lantern, red hull with middle section white. Stack, mast, and lantern black. "RELIEF" in black on each side. Shows a fixed white light of 480 candlepower, 40 feet above water. The fog signal is a 10-inch steam whistle, sounding a blast of 10 seconds duration every 40 seconds.

Detroit River—Buoys to be established above the head of Belle Isle:

Boat Crossing Buoy, 2, 3d-class spar, in 16 feet

(*Continued on page 58*)

16 ft. boat finished in mahogany with 2½ H. P. Motor $215. Clutch $20 extra. 20 ft. boat finished in mahogany, 5 H. P. 2 cylinder Palmer Motor $345. Clutch $20 extra. W. J. Moxley & Son, Cos Cob, Conn.

AVOID disaster by using a DIRIGO compass on that boat. All materials first class. No rubber gaskets to rot. A very hard pivot and high-grade jewel. Navy degree circle on dial. Brass and mahogany binnacles. Also new course finder and bearings instrument. Send for descriptive catalog.
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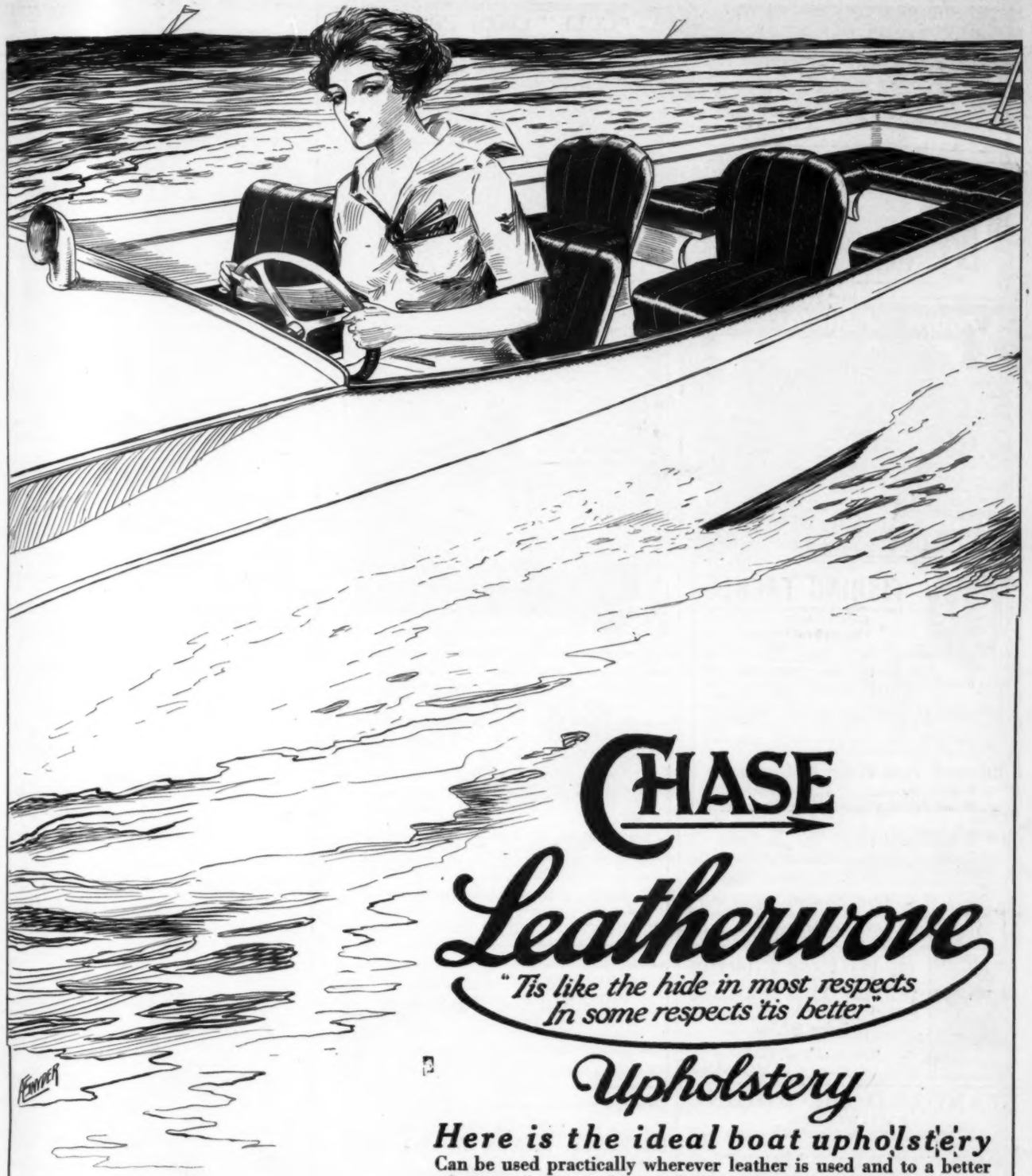

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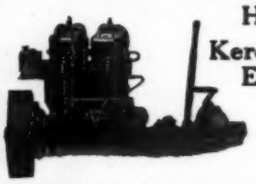

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FIGURE 1404

IMPROVED MOTOR BOAT CLOSET

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Buy Battleship Bunting

BETSY ROSS FLAG CO.

FAMOUS FOR FLAGS

NEWBURGH, N. Y

Changes in Aids to Navigation

(*Continued from page 56*)

of water on the north side of shoal above Belle Isle.

Boat Crossing Buoy, 1, 3d-class spar, in 16 feet of water on the south side of shoal above Belle Isle.

Note.—Small boats will be required to cross channel between these buoys and the head of Belle Isle.

Lake St. Clair—St. Clair Flats—Old Channel.—Changes made:

Old Channel Light No. 1 established in 14 feet of water on the west side of the channel near the location of Entrance Buoy, 1, which will be discontinued. The light is fixed white, of 40 candlepower on a white pile, 8 feet above water.

Old Channel Light, No. 3, established in 21 feet of water at a point near the present location of Elbow off upper end of Ship Canal Lower Buoy, 3, which is discontinued. The light is fixed white, of 40 candlepower, on a white pile 8 feet above water.

Lake Michigan, East Side—Richards Reef Bell Buoy, 2; established in 21 feet of water, 3d-class spar alongside, on westerly side of reef.

Lake Michigan, East Shore.—White River Light Station: white light is of 2,200 candlepower and red light is 670 candlepower; each flash is of 1.5 seconds and each eclipse is of 18.5 seconds' duration. Grand Haven Pierhead Range Rear Light: fixed light is of 150 and flash 390 candlepower; flash is of 4.5 seconds' duration.

Lake St. Clair—Anchor Bay—Clinton River Range Front Light destroyed by ice—Temporary light has been established, on group of piles, 8 feet above water, on north side of entrance, about 400 yards 91½° true from the rear light. To be maintained in this location pending the rebuilding of the former structure.

St. Mary's River—Sites of light structures carried away by ice will be temporarily marked by lighted spar buoys pending reconstruction of the permanent structures. Lighted buoys established:

West Neebish Channel East Side Light, No. 16: structure completely destroyed. A red spar buoy, numbered 16, carrying a fixed red light, of 3 candlepower, will be maintained to mark the site.

West Neebish Channel West Side Light, No. 13: structure completely carried away. A black spar buoy, numbered 13, carrying a fixed white light, of 10 candlepower, will be maintained to mark the site.

Middle Neebish Cut South Side Upper Light, No. 5: entire superstructure of pier carried away. A black spar buoy, numbered 5, carrying a fixed white light, of 10 candlepower, will be maintained to mark the site.

Lake Superior—Eagle River Shoal Fog Signal Station, established at a point on shore of Lake Superior, about 5 miles west of town of Eagle River. An electric siren, sounded from a gray, one-story building; to sound a blast every 20 seconds, thus: blast, 10 seconds; silent, 10 seconds.

Lake Michigan, East Side—Pyramid Point Shoal Buoy, 5, established: 2d-class can, on north end of shoal.

Lake Michigan, East Side—Sleeping Bear Gas Buoy, 7, changed to flashing every 3 seconds, flash 0.3 second duration, of 70 candlepower, 8 feet above water. The buoy is cylindrical, with skeleton superstructure.

Lake Michigan, West Side—Manistique Light Station—Color of structure changed to red.

INDIANA

Lake Michigan—South End—Indiana Harbor—Changes in buoys made:

West Bank Gas Buoy, 4, is spar-shaped; the light is 13 feet above water.

North Bank Gas Buoy, 6, is conical with skeleton superstructure; the light is 11 feet above water.

WISCONSIN

Lake Michigan, West Side—Sturgeon Bay Canal—Lights changed:

Northwest Entrance: No. 3 Light, changed to flashing red every 3 seconds, flash 0.3 second duration, of 35 candlepower, 19 feet above water, on red skeleton steel tower.

Northwest Entrance to Cut: No. 4 Light, changed to flashing white, every 3 seconds, flash 0.3 second duration, of 70 candlepower, 21 feet above water, on white skeleton steel tower.

MICHIGAN

Lake Michigan—Green Bay, South End—Menominee Pierhead Range Lights—Color of structures changed to red.

Lake Michigan, West Side—Outer Shoal Gas and Bell Buoy, 1, established, in lieu of Outer Shoal Bell Buoy, 1, which has been discontinued. The combination buoy is conical with skeleton superstructure and shows an occulting white light every 20 seconds; light 10 seconds, eclipse 10 seconds, of 120 candlepower, 11 feet above water.

Lake Michigan—Green Bay—Sturgeon Bay—Sherwood Point Light Station—Intensity of light increased and duration of flash decreased. Fixed white light increased to 1,700 candlepower, red flash increased to 4,300 candlepower; duration of flash is 1.3 seconds.

Lake Michigan, West Side—Milwaukee Breakwater Light. Color of structure changed to red.

Lake Michigan, West Side—Milwaukee South Pierhead Light changed to flashing white, of 70 candlepower. Color of structure changed to white.

Milwaukee Pierhead Range Front Light: color of structure changed to red.

Milwaukee Pierhead Range Rear Light: color of structure changed to red.

Kewaunee Range Front Light: color of structure changed to red.

Lake Michigan, West Shore—Two Rivers Pierhead Light—Color of structure changed to red.

Lake Michigan, West Shore—Changes in lights made:

Pilot Island Light Station: regular characteristic of light restored and intensity increased. The fixed light is of 1,700 candlepower and the flash is of 17,000 candlepower of 1 second duration.

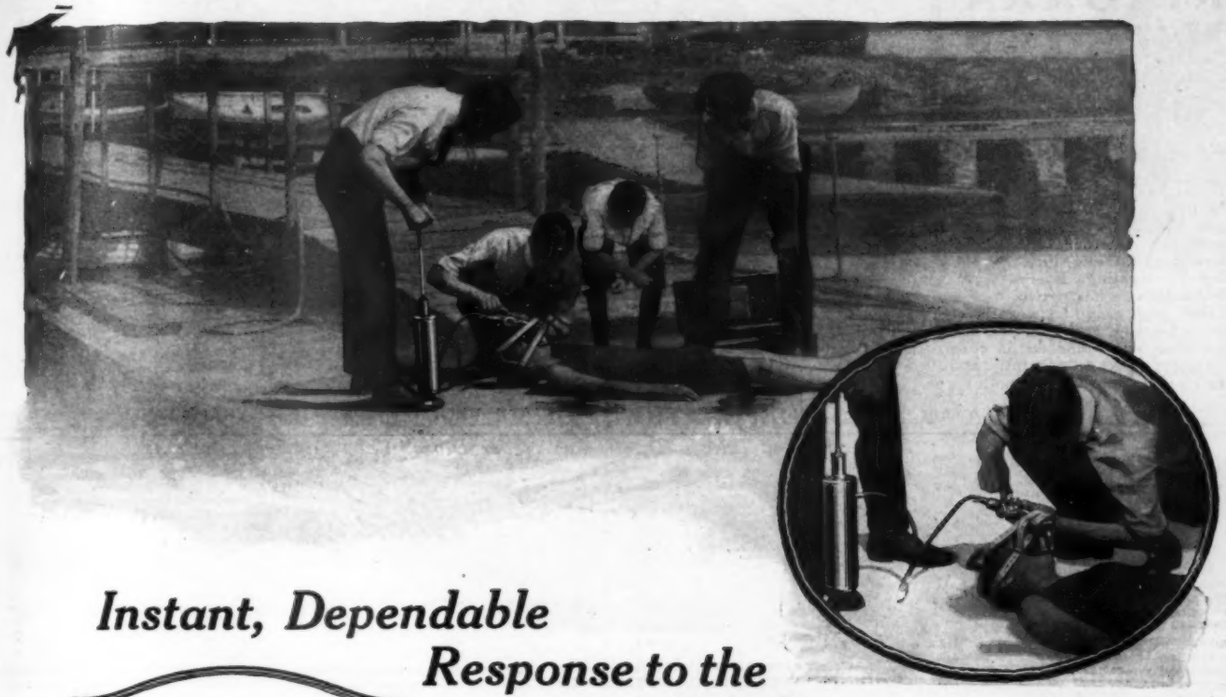
Plum Island Range Lights: front light is of 730 candlepower and the rear light is of 870 candlepower.

Lake Michigan—Green Bay, North End—Intensity of lights increased:

Eagle Bluff Light, increased to 2,600 candlepower.

Chambers Island Light, fixed light increased to 1,700 candlepower, flash to 14,000 candlepower. Flash 2 seconds' duration.

Lake Michigan—Green Bay—Green Island Light Station—Intensity of light increased to 1,700 candlepower.



Instant, Dependable Response to the Cry for Help!

Vital Advantages of Type "B" Pulmotor

Assists in clearing the lungs of water.

Automatically produces respirations identical in depth and cadence with the natural breathing of each individual upon whom it is used.

Signals the patient's first attempt to resume breathing and guides operator in assisting patient to full recovery after breathing is recommenced.

Permits a physician to vary lung pressures for any special need as he judges best.

Indicates instantly presence of anything in throat clogging air passages to lungs. Prevents any possibility of gagging, choking or suffocation of patient.

Allows spontaneous breathing at once upon return of consciousness.

THE safety of your fellow club members and their guests, of your own, of yourself, your guests, your own dear ones, your responsibility as a club member and citizen demand that you get complete information about this necessary part of your club's equipment. No yacht club can afford to be without the protection of this perfected resuscitation apparatus, the product of the world's oldest and leading manufacturer of life saving and rescue apparatus.

Even the strongest swimmer is liable to water accidents. The younger club members, women guests, and youngsters are continually exposing themselves to dangers that only a Pulmotor can prevent from ending tragically.

Pulmotors are the standard resuscitation apparatus the world over, used and relied upon by the U. S. Navy, Coast Patrols, Life Saving Services—in fact all whose business it is to rescue the drowning. They know the inefficiency of all other methods—the terrible consequences of not having Pulmotors. Time after time the Pulmotor has saved lives when all other means had failed and hope seemed lost.

Type "B" Pulmotor is well within the reach of even the smallest yacht club. It costs only $115 with all accessories, and the first cost is the only cost. Anyone can operate it with complete safety to patients. Weighs only 12 lbs., and is hand-operated.

Write now before a tragedy occurs. Your club now, this minute, needs the protection of this life saving apparatus. Demonstrations arranged at your convenience. Send at once for interesting literature.

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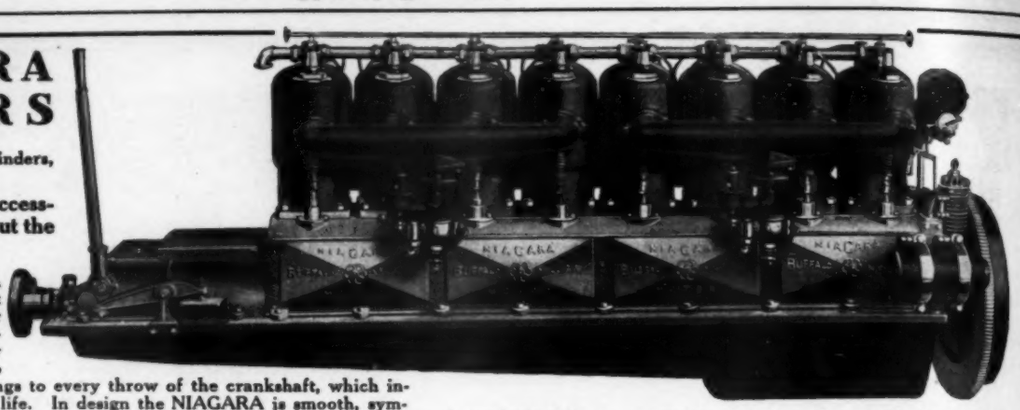
Pulmotor "Type B"

The genuine always bears the name DRAEGER

NIAGARA MOTORS

4 Cycle Type
In 2, 4, 6 and 8 Cylinders, 5 to 200 H. P.

Over 11 Years in Successful Service Throughout the World.



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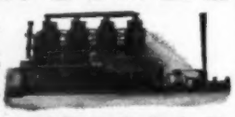

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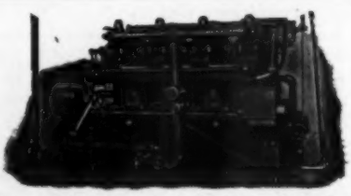

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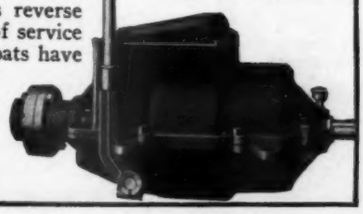

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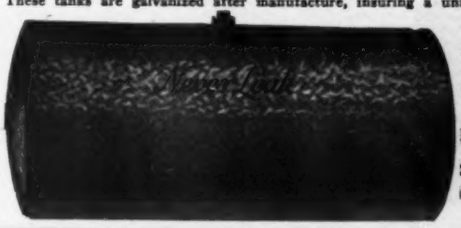

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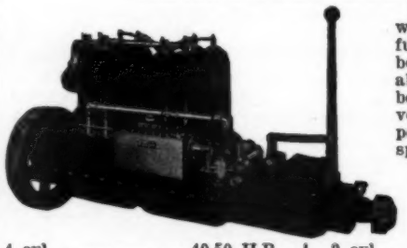

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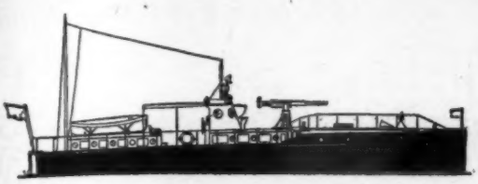

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It is adjustable from inside the boat to any angle desired, making it easy to get and maintain perfect alignment. The only shaftlog that provides for an outside sleeve to prevent moss or weeds wrapping around shaft.

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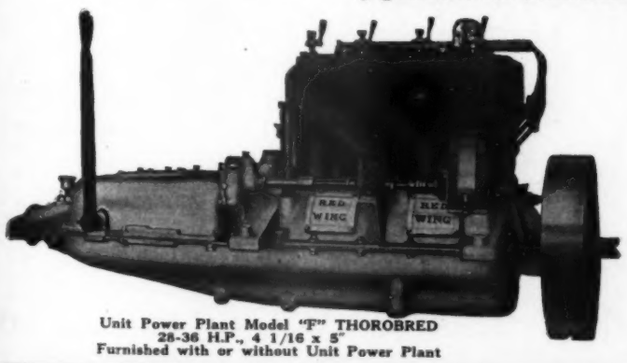

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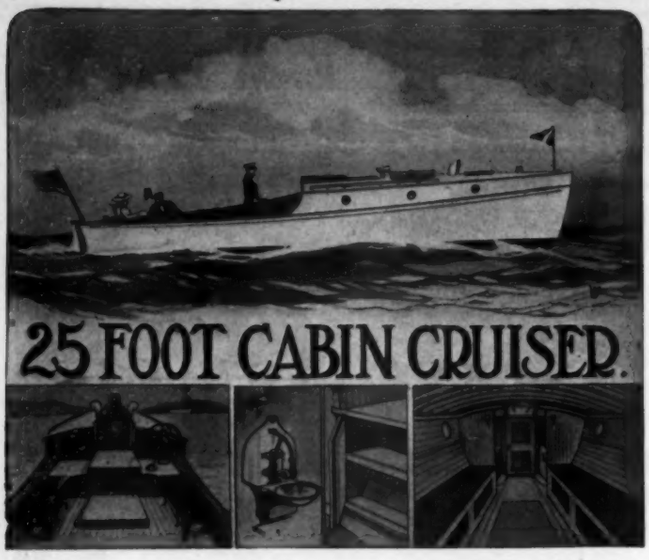

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Our 25 foot cruiser is for those who must have a good boat. It is built for salt water service, copper fastened throughout. Construction and workmanship is the best,—equal in every respect to the high class of yacht work on which our reputation has been based for over twenty years.

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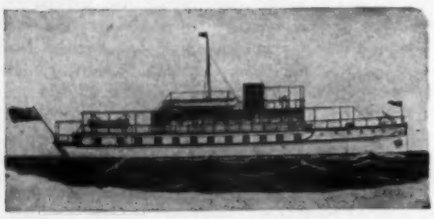

106-ft. Houseboat Chieftain, built for the Armours.

Note, on any list of America's finest boats, how

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The reason is not hard to find.

The same discernment, which makes men like **George W. Perkins, Jas. Deering, Murray Guggenheim, A. P. Ordway, L. H. Armour and A. W. Armour** successful, leads them to select the boats which combine best value, greatest comfort and most satisfactory service at greatest economy in operation.

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(Patented)

Dependability — isn't that the thing that you want, above all else, in your boat and engine? Go to the root of the matter and you'll find that this dependability is a question of securing dependable ignition. Of importance hardly secondary is the necessity for dependability in the lighting generator, if one be used. You are seeking facts? Note this: So general is the use of "NORMA" Bearings in high-grade magnetos and lighting generators furnished on boats and cars of the better class that the fact that its accessories are "NORMA" equipped is evidence of dependable quality in a boat.

Be SURE—See That Your Electrical Accessories Are "NORMA" Equipped.

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The Biggest Contract

Ever Dreamed of by a

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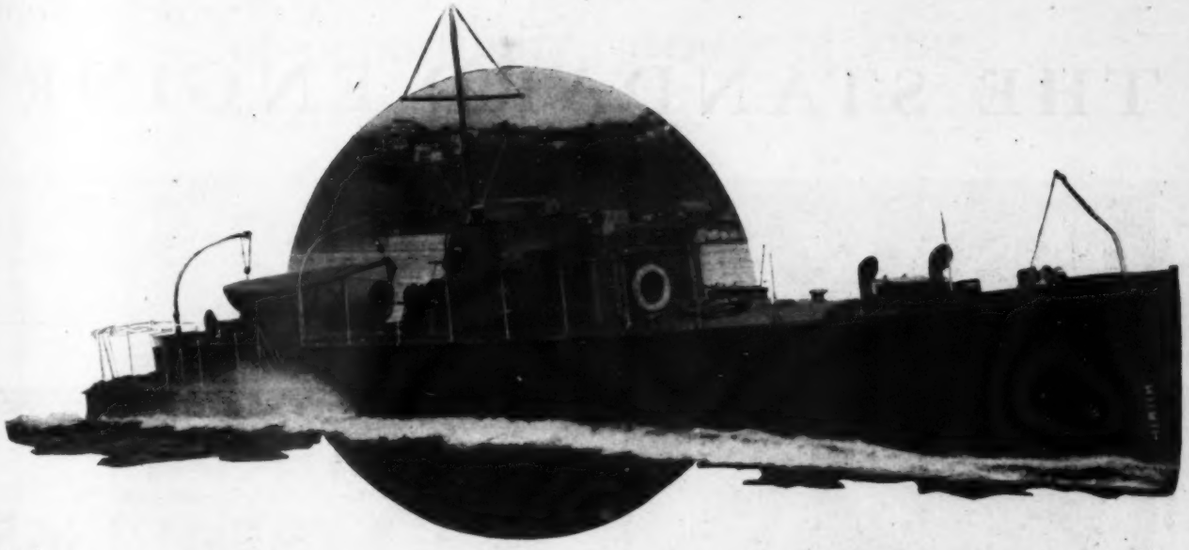

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The seal of World's Leadership, the glory of Success, born only of opportunity, grown of long years of hard work.

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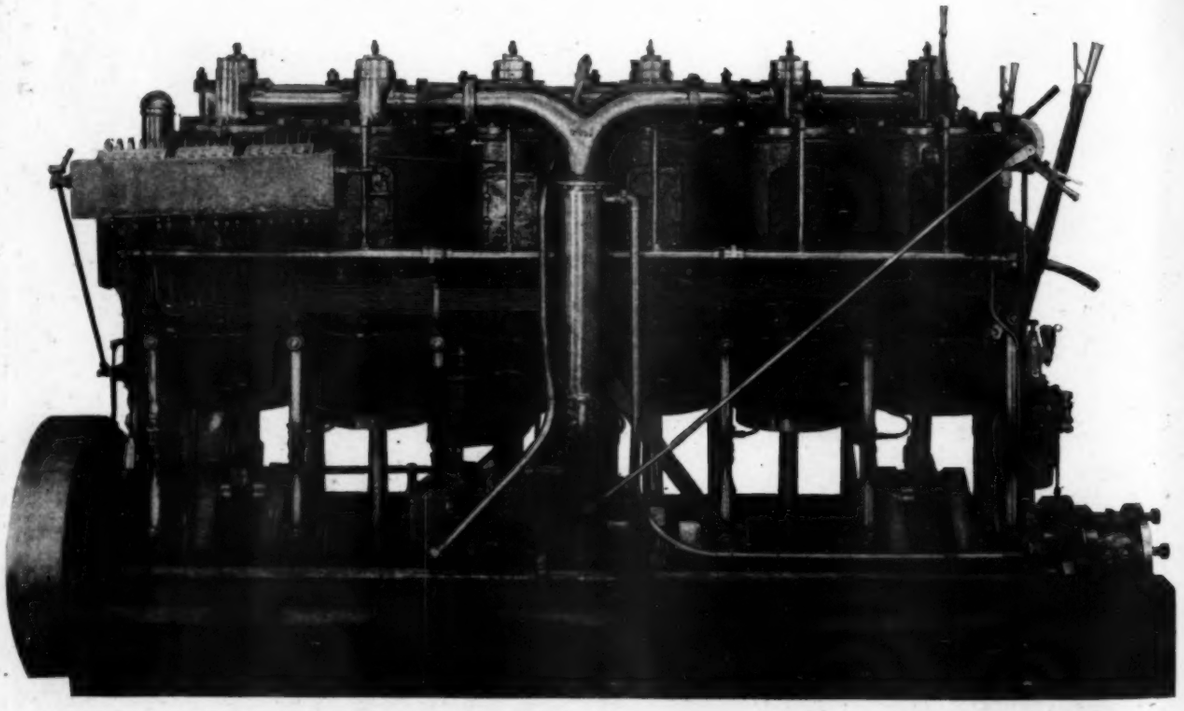
178 Whiton Street **Jersey City, N. J.**

THE BRITISH ORDER

was the tribute of the strong to the strong, the courageous to the courageous, the tried to the tried; for the filling of this order required the strength of forces trained in big deeds, the courage gained of conquests won, the tested in action and proven able,—and with all the Generalship of knowledge come of experience.



Back of the Standard Guarantee is

The Standard Motor Construction Company

178 Whiton Street **Jersey City, N. J.**

One of 550 new 80-foot Elco submarine chasers now in active service abroad—
all finished with Murphy Transparent Spar Varnish

A swift answer to the submarine menace

The submarine's grip began to tighten. England faced strangulation. Nothing afloat could lessen that grip. An entirely new type of craft was needed—hundreds of them and *at once*. Team work made the impossible possible. 550 days after the first keel was laid, the Elco Company of Bayonne, N. J., had completed 550 of these swift sea wasps.

We take pride in our share of this great ship-building feat, the greatest in any war, in the foresight and resources that enabled us—when the enamel raw material market was demoralized—to deliver *on time* the necessary supply of Murphy White Enamel and

Murphy Transparent Spar Varnish

"the varnish that lasts longest"

The rough work these boats are engaged in, with no time for upkeep, made the use of tough, durable, waterproof finishes imperative. The quality of Murphy Transparent Spar Varnish had been tested by the Elco Company fourteen years. For half a century it has been in active service on our battleships and in our merchant marine. When war came its selection for the hardest job was a matter of course.

We are always prepared to meet emergencies. Consult us, no matter how impossible of fulfilment your requirements may seem.

MURPHY VARNISH COMPANY

Franklin Murphy, jr., President

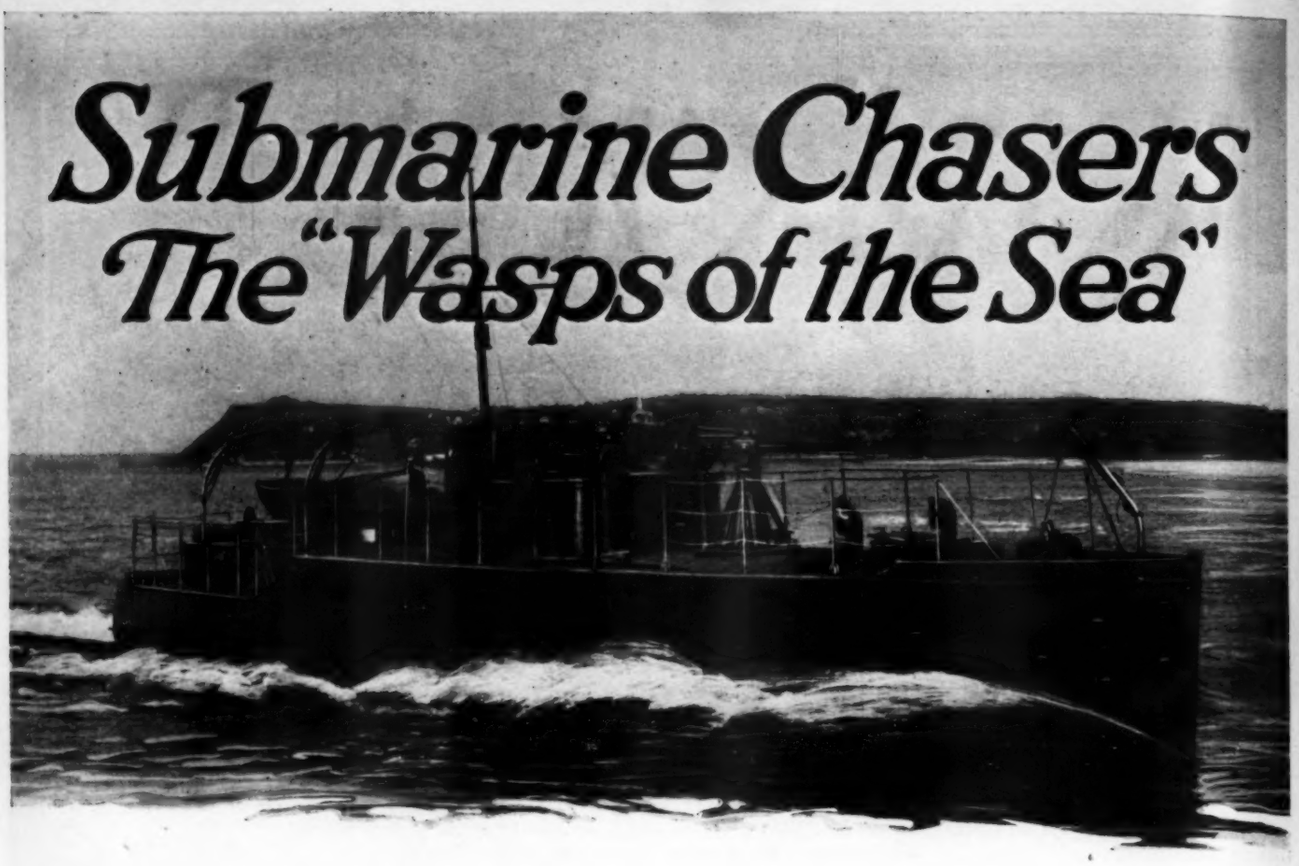
Newark New Jersey

Chicago Illinois

Dougall Varnish Company, Ltd., Montreal, Canadian Associate

ANA

Submarine Chasers
The "Wasps of the Sea"



Not alone to the Lordly Battleship and the Powerful Cruiser belongs the mastery of Old Ocean. It is shared by the swift, efficient Elco Submarine Chaser, most dreaded foe of the German "U" Boat.

A LINE of elephants can be stampeded by a mouse. Elephant trainers say that mice have been known to run up the inside of elephants' trunks. These biggest and strongest of animals go into paroxysms of terror, if they learn that a mouse is hidden in the hay around their feet.

A dog solves the problem. A tiny fox terrier is introduced. He kills or chases away the mice, and the elephants eat and sleep and do their work, content in the knowledge that the mice are being kept away.

Imagine, if you please, the dreadnaught to be the elephant, the submarine to be the mouse and the highly efficient fox terrier to be the Elco Submarine Chaser and you have a fair presentation of the facts which have minimized the efforts of Germany to control the seas through the reprehensible efforts of her "U" Boats.

The allies had battleships and cruisers sufficient to dominate the seven seas but naval warfare changed over night; changed just as suddenly as it did in 1862, when the ironclad Merrimac rammed and sunk the warships Congress and Cumberland off Newport News.

These facts become apparent.

Battleships and cruisers cannot be profitably separated from the main fleet in order to chase submarines.

Submarines cannot be fought with submarines.

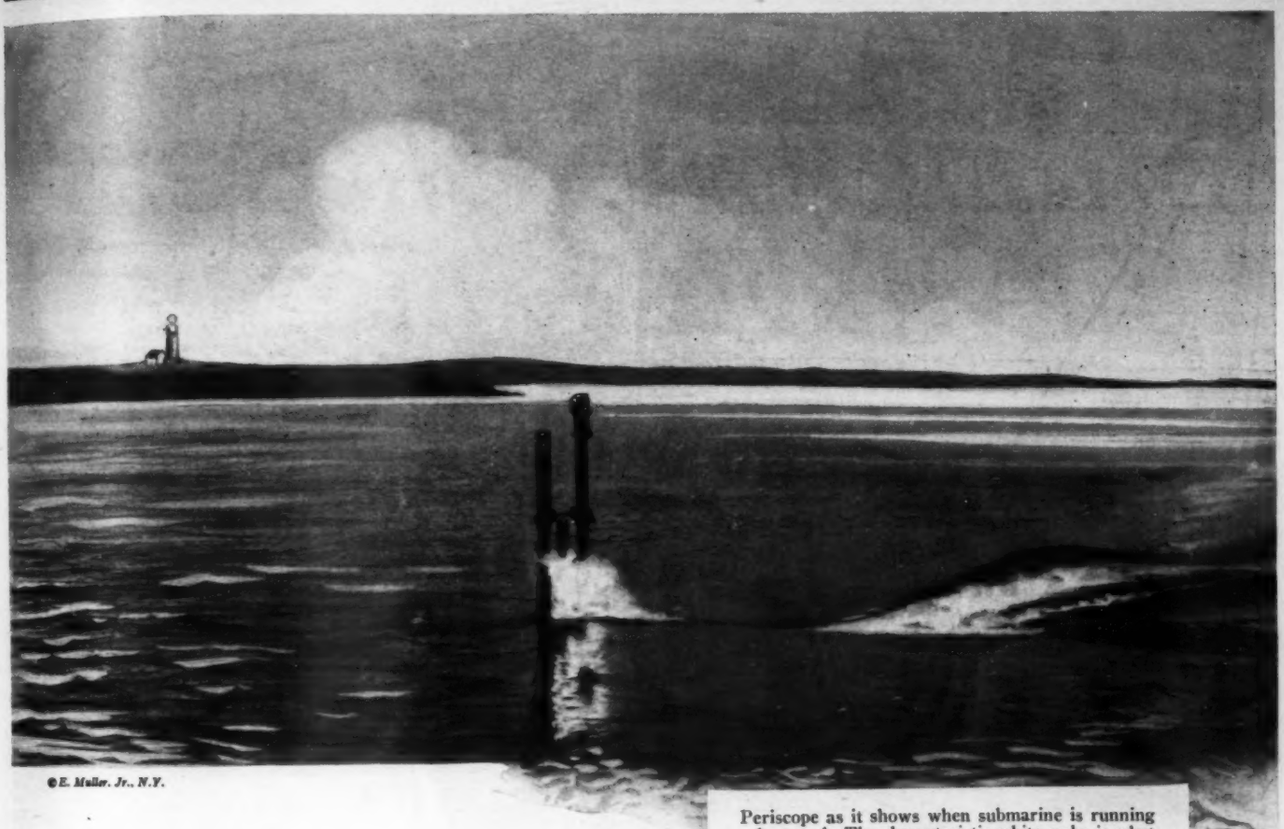
So, in order to keep the sea lanes open in order that merchantmen could safely transport food and munitions it became necessary to have hundreds—many hundreds—of small swift craft, adequately armed, which could maintain a ceaseless patrol of the sea.

Every motor boat, tug and pleasure yacht that England could command was pressed into service, but there were not enough. The cry went up for more boats, more guns, to guard the sea lanes over which was coming the food and war supplies that meant victory or defeat.

And Yankee ingenuity solved the problem—solved it so expeditiously that 550 submarine chasers were built and turned over for service in 488 days, exclusive of Sundays. Think of it!

Imagine the energy, concentration, special-

How Elco Efficiency Astonished the World



©E. Muller, Jr., N.Y.

Periscope as it shows when submarine is running submerged. The characteristic white wake is what first catches the eye of the naval gunner. The small projection under the brace of the periscope is the whistle.

ization and intensive standardization necessary. New factories had to be built, working forces organized, material bought.

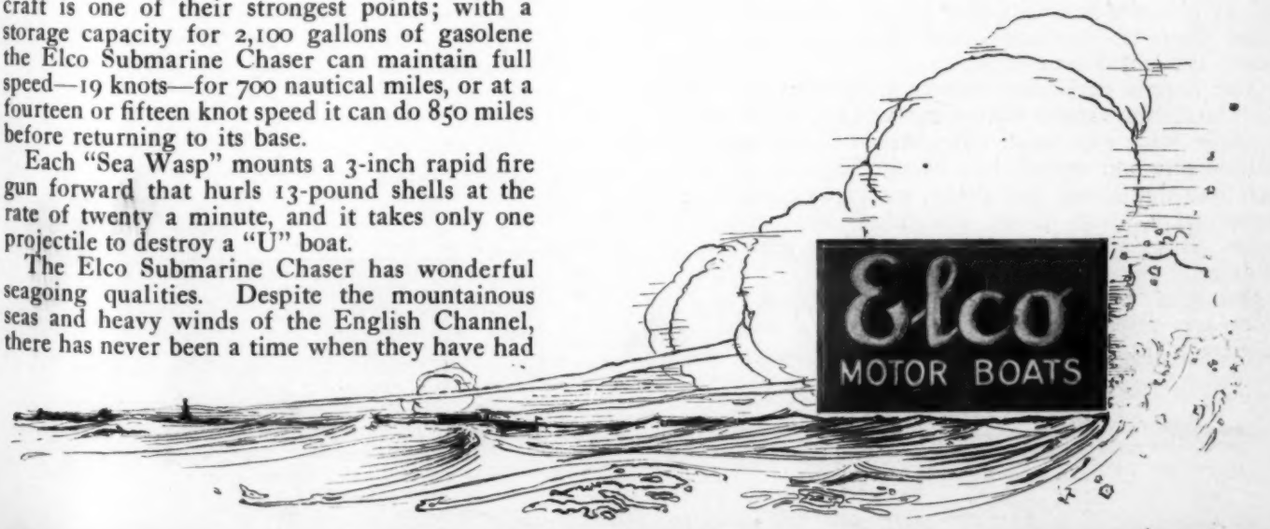
No greater task was ever set. But the Elco Company did it and did it so well that now they have started in to repeat the performance—this time for Uncle Sam.

The Elco Submarine Chaser is 80 feet over all, with 12 feet 6 inches beam, 30 tons displacement, 4 feet 6 inches draft, with a speed of 19 knots. She carries a crew of ten men and can keep to sea for twelve days. Two 220 horsepower gasoline engines supply the power, 440 horse power in all.

The "steaming radius" of these efficient little craft is one of their strongest points; with a storage capacity for 2,100 gallons of gasolene the Elco Submarine Chaser can maintain full speed—19 knots—for 700 nautical miles, or at a fourteen or fifteen knot speed it can do 850 miles before returning to its base.

Each "Sea Wasp" mounts a 3-inch rapid fire gun forward that hurls 13-pound shells at the rate of twenty a minute, and it takes only one projectile to destroy a "U" boat.

The Elco Submarine Chaser has wonderful seagoing qualities. Despite the mountainous seas and heavy winds of the English Channel, there has never been a time when they have had



How Elco Efficiency Astonished the World

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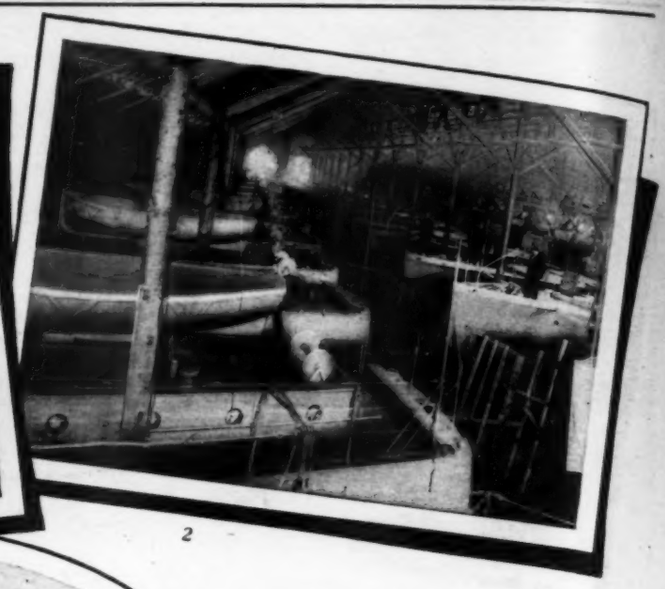


2

3

1 Interior of Levis, Quebec, shop where the frames were planked and wood construction was accomplished.

2 Interior of boat-building shop at Levis, Quebec, showing fifty completed Submarine Chasers ready for launching.

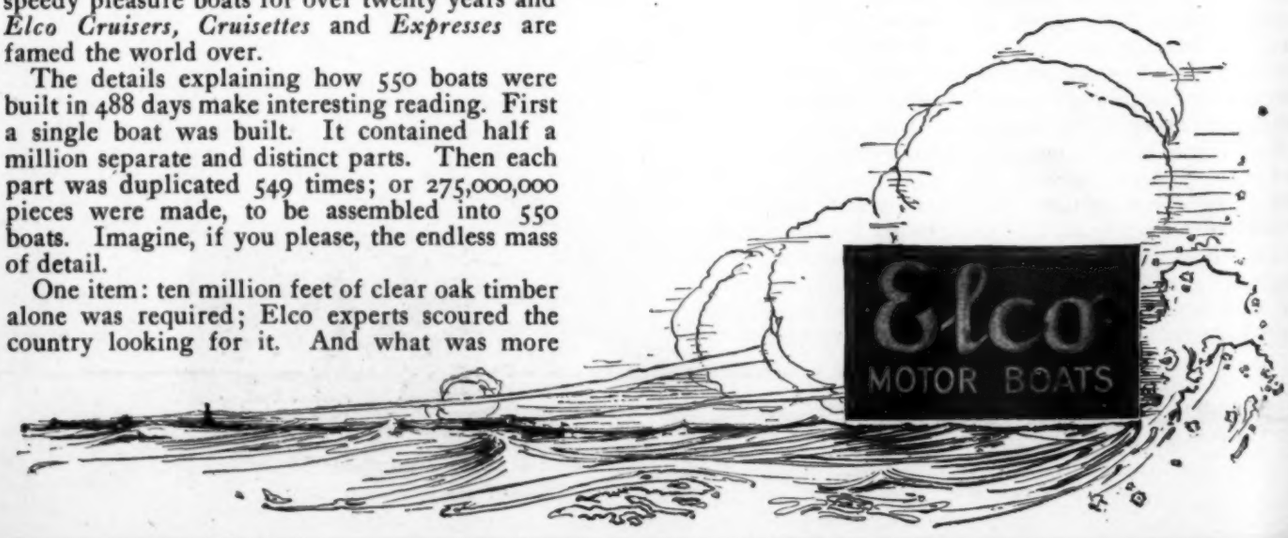
3 Storage basin at Indian Cove, where the tested and accepted submarine chasers were held awaiting shipment abroad.

to run for shelter. In fact, the Elco Submarine Chaser is the highest development of the American pleasure yacht built, perhaps, a little sturdier, a little heavier, in view of the work she is expected to do.

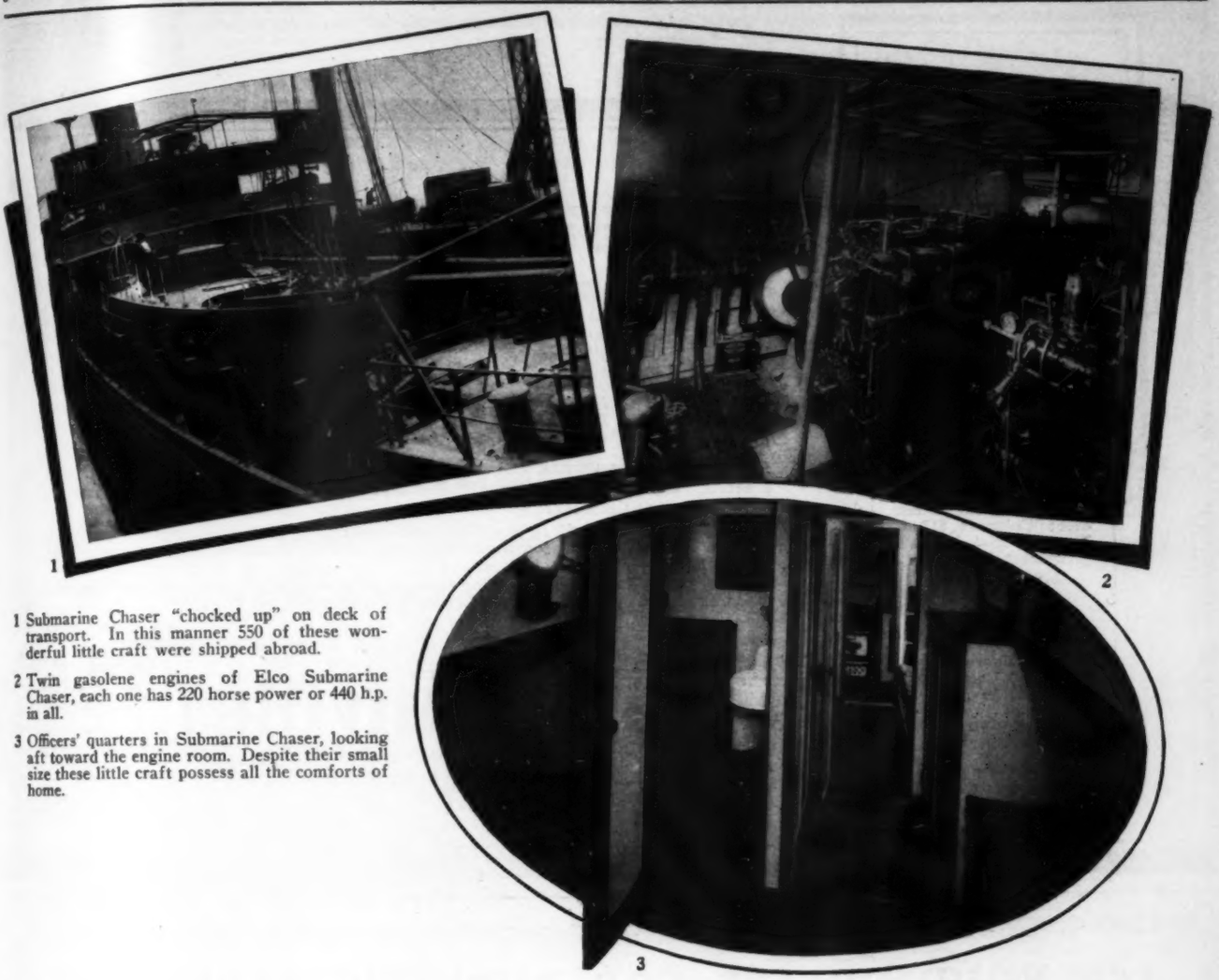
—for the Elco Company has been building speedy pleasure boats for over twenty years and *Elco Cruisers, Cruisettes* and *Expresses* are famed the world over.

The details explaining how 550 boats were built in 488 days make interesting reading. First a single boat was built. It contained half a million separate and distinct parts. Then each part was duplicated 549 times; or 275,000,000 pieces were made, to be assembled into 550 boats. Imagine, if you please, the endless mass of detail.

One item: ten million feet of clear oak timber alone was required; Elco experts scoured the country looking for it. And what was more



How Elco Efficiency Astonished the World



1 Submarine Chaser "chocked up" on deck of transport. In this manner 550 of these wonderful little craft were shipped abroad.

2 Twin gasolene engines of Elco Submarine Chaser, each one has 220 horse power or 440 h.p. in all.

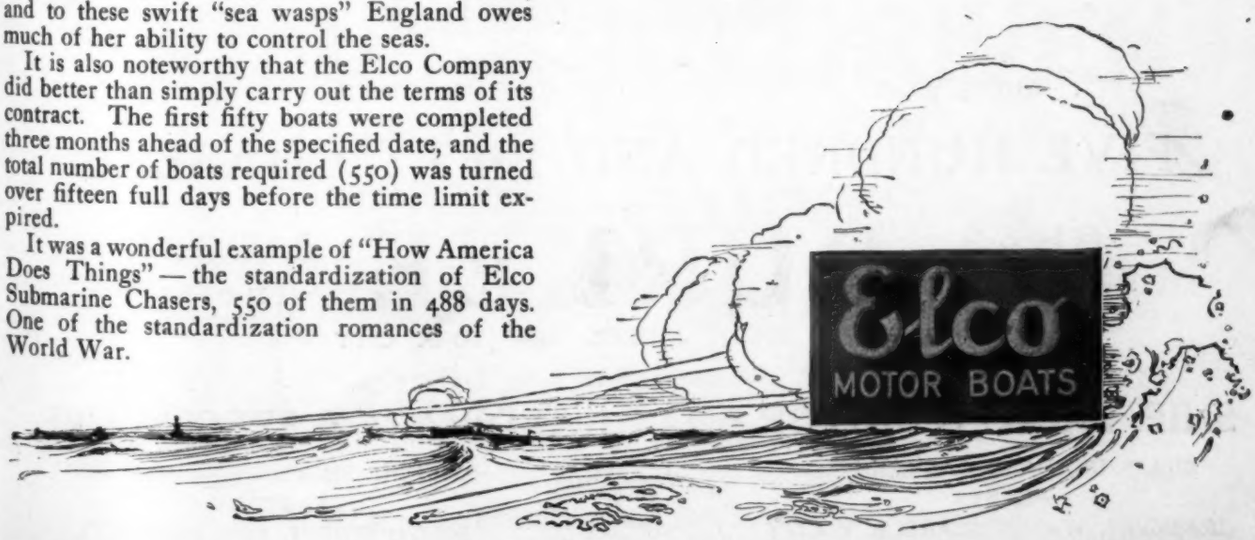
3 Officers' quarters in Submarine Chaser, looking aft toward the engine room. Despite their small size these little craft possess all the comforts of home.

difficult—arranged for its transportation, after the timber had been actually purchased.

Each boat, when turned over, was complete to the last stay and rope; each boat on her trial trip did better than the 19 knots required. Every boat reached England in good condition—four at a time—were sent over on the decks of liners; and to these swift "sea wasps" England owes much of her ability to control the seas.

It is also noteworthy that the Elco Company did better than simply carry out the terms of its contract. The first fifty boats were completed three months ahead of the specified date, and the total number of boats required (550) was turned over fifteen full days before the time limit expired.

It was a wonderful example of "How America Does Things" — the standardization of Elco Submarine Chasers, 550 of them in 488 days. One of the standardization romances of the World War.



How Elco Efficiency Astonished the World

Fire Armament

IT is a signal tribute to the efficiency of the J-M Fire Extinguisher that it was chosen as official equipment for the Elco Submarine Chasers built in record time for the British Admiralty—550 tireless watch-dogs of the sea, engaged in war's most thrilling service.

At the beginning it was determined that no chances could be taken—that every part from truck to keel must be ready—ready for the emergency. And so the J-M Fire Extinguisher was selected to protect from fire these sturdy guardians of world commerce.

No one knows when fire will strike—but one must always be prepared to meet it. Government regulation demands a fire extinguisher on your boat—why not carry the best?

The J-M proves itself as the best extinguisher for your boat, because of sound construction, effectiveness on motor-boat fires, and its exclusive two-way method of operation.

The Johns-Manville Fire Extinguisher is approved by the Underwriters' Laboratories, Inc., used by the U. S. Army and Navy Departments.

Price in United States, east of Colorado, $10.00. Brass or nickel finish, bracket included.
$10.50 Colorado and West.
Dominion of Canada:
$12.00 East of Calgary.
$12.50 Calgary and West.

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New York City

10 Factories
Branches in 55 Large Cities

Johns-Manville Fire Extinguisher

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ARE ALSO

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THERE IS A REASON

MERIT COUNTS

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The fact that we were selected to supply all the canvas equipment for the

British Submarine Chasers

built by the Elco Co. is the best possible proof of our ability to outfit your boat with the greatest satisfaction to you.

Quality—Quantity—Price—Prompt Delivery

We are prepared to execute orders of any size, small or large.

Headquarters for Flags, Pennants and Emblems

Among the articles we supplied for the submarine chasers were weather cloth bridge covers, bunk bottoms, steering wheel covers, telegraph and engine room covers, life boat covers, hatch covers, searchlight covers, ventilator covers, main auxiliary engine covers.

Let Us Quote on Your Requirements.

Columbus Mfg. & Supply Co., Inc.

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Ordered Your Sub-Chaser To Help Uncle Sam?

You can be a mighty good fellow and a red blooded patriot if you will have us build you an A.B.C. Sub-Chaser; one that will nip periscopes on sight and then dart away looking for another "Sub." You should ask us to tell all about our new 75-footer.

Maybe there are a number of other good fellows who would like to club with you. Others are doing it now.

Will you write us today?

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REFINISHED
WITHOUT REGRINDING

DON'T throw away your wrist-pin scored cylinders or have them reground and new pistons fitted. We can refinish them as good as new, at a fraction of the cost. No scores are too deep to repair. We also fill up porous holes.

We have thousands of satisfied customers among automobile manufacturers, repair men and owners who will testify to the quality of our work and the practicability of our process.

By our own patented process we fuse electrically a silver and nickel alloy into the scores, which restores the surface to its original accuracy and makes the old pistons and rings fit as compression-tight as when new.

We do not warp the cylinders or enlarge the bore. All work is guaranteed for the life of the cylinder.

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KEROSENE

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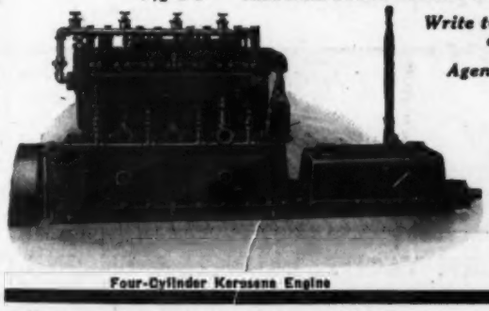
The Wright Kerosene Engine is thoroughly perfected. The kerosene is perfectly *gasified* before it enters the cylinders. It burns clean, free from carbon or lubricating troubles. No smoke or odor in exhaust.

Valves in cylinder heads. Make and break ignition. Bosch Low Tension Magneto

3-Cyl. ....6 x 7½", 22-30 H.P.
3-Cyl. ....7½ x 9 ", 35-45 H.P.
4-Cyl. ....6 x 7½", 30-40 H.P.
4-Cyl. ....7½ x 9 ", 45-60 H.P.
6-Cyl. ....6 x 7½", 45-65 H.P.
6-Cyl. ....7½ x 9 ", 70-90 H.P.

6 x 7½" runs from 400 to 550 R. P. M.
7½ x 9 " runs from 350 to 475 R. P. M.



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You have a choice of three methods. Build your own boat from Defoe K. D. parts or frames—or have it built economically by your local builder.

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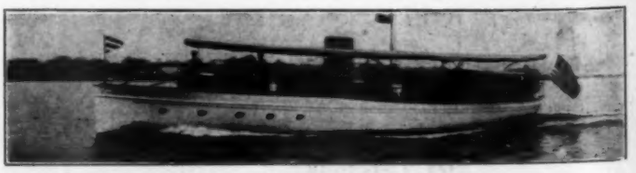
Strictly high grade four-cycle engines, built for heavy duty service.



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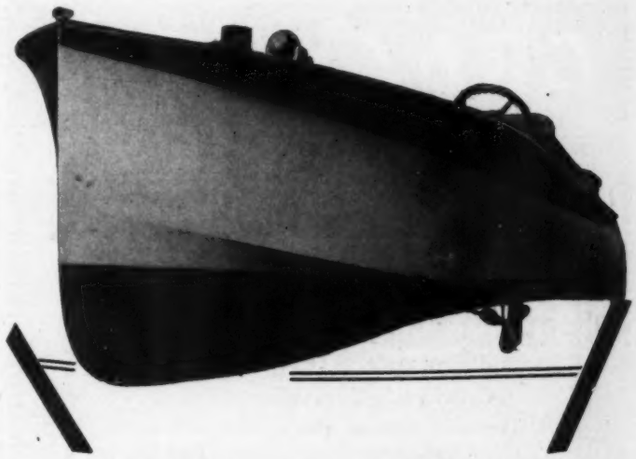

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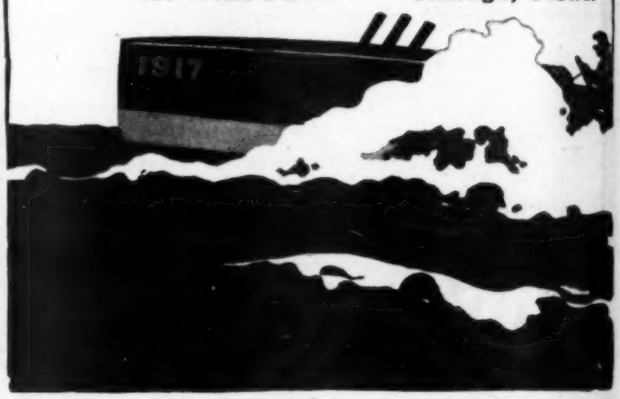

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The most durable spar varnish ever made. Will not spot, crack, blister, scale or turn white. Unaffected by salt or fresh water.

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"Sea Craft Suggestions and Supplies"—enlarged edition, 216 pages. Full of live hints for boatmen on Ground Tackle, Compasses, Steering Gear, etc. Sent only on receipt of 25c. Well worth having.

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Trade Mark Registered

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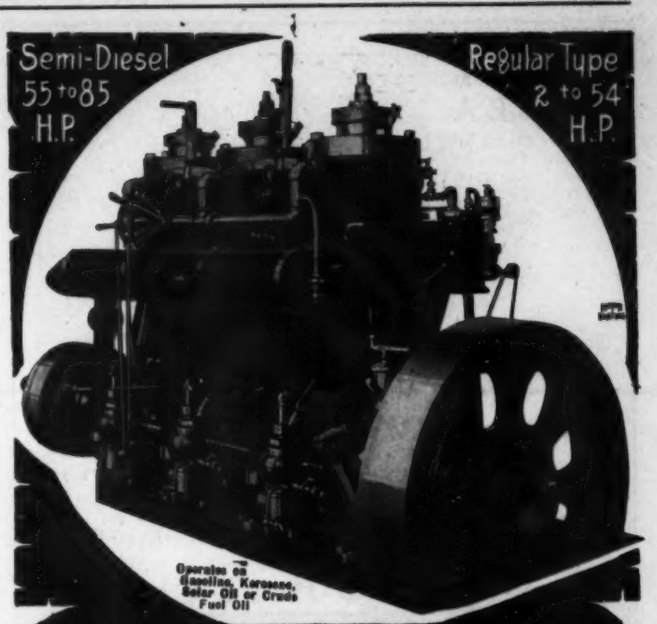

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Heavy Duty Oil Engines—Maximum Power—Minimum Cost

The actual facts about the performance of these engines are so astonishing that every buyer of a marine engine should know the full Kahlenberg story before he selects a power plant for his boat.

Write to-day for full details.

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MANZEL FORCE FEED OILER

ON YOUR ENGINE

Don't take chances in the matter of lubrication. If your lubricating system fails to work for just ten minutes while the motor is running, your engine will be little better than so much junk.

Manzel Force Feed Oil Pumps are the most reliable lubricators that can be made for marine engines. They force the oil under pressure to each bearing and friction surface separately. No attention is required except to refill the oil tank.

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The life saving invention sought since navigation began. The only life insurance for any boat owner to carry for himself, guests and crew. The real life preserver.

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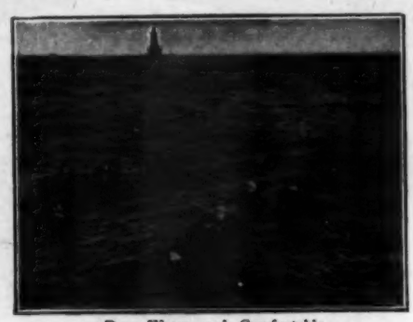

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Midway between the extravagantly high-priced marine engines and the cheap built-to-sell motors stands the Miller—a thoroughly high grade power plant embodying the best of design, materials and construction at a price based on the actual cost of production.

There is not a cent wasted on unnecessary material or labor in a Miller engine. On the other hand, nothing is shaved or skimped to cut the cost at the sacrifice of efficiency or reliability.

Every Miller Engine represents the utmost service value your engine money can buy. Eighteen popular models, medium and heavy duty types, from 4 to 65 H.P. Also one and two cylinder portable rowboat motors.

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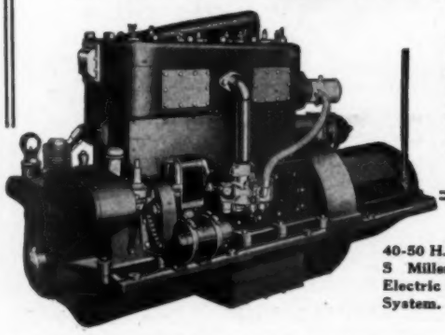

40-50 H.P. Four Cylinder Model S Miller Motor with Bosch Electric Starting and Lighting System.

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Hall's First Aid Kit for motor boat owners takes up little room, yet is always ready for emergency. If your druggist does not yet have Hall's Kits in stock send us $1.25 and we will ship at once.

CONTENTS:	
1 Package Cotton	1 Tube Carbolated Petrolatum
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Size of container: 3 in. x 4 in. x 2½ in.

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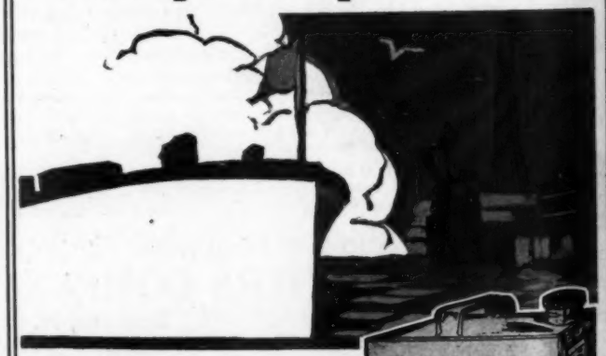
Waterproof Spar Varnish



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SAFETY FIRST
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will increase the speed, reduce fuel consumption and give a larger cruising radius. The increase in efficiency is often very great. It is a powerful anti-fouler, has a hard slippery finish which lasts a long time, and it saves expensive scraping and repainting work. For racing it takes a wonderful slippery polish which adds to speed. ON IRON OR STEEL—it is NOT A COPPER PAINT and it IS NON-CORROSIVE ON METAL.

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For all types of Internal Combustion Engines

Each device designed for a particular purpose; practical and durable in construction, and reliable in operation.

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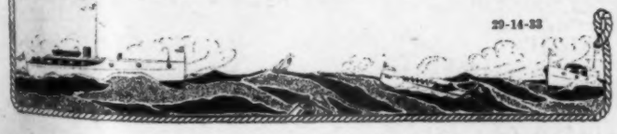

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Quality without extravagance

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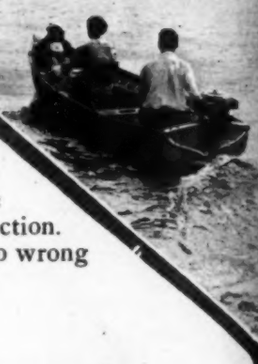

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Designed by America's leading naval architects, built in the world's largest boat factory. Mullins steel boats cannot leak, water log, dry out, warp or open at the seams—need no boat house and never require calking. The motor boats are powered with 2 and 4-cycle engines, correctly installed and equipped with Silent Underwater Exhaust. They are light, graceful and speedy. Whether you wish to pole, row or motor in fresh or salt, deep or shallow water you need a Mullins boat. Forty models now ready for delivery.

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2 Cylinder 4 H.P. Detachable

ARROW Rowboat Motor has greater speed, power and flexibility, more dependable ignition, easier control and more economical carburetion than any other detachable rowboat motor simply because of definite ideals accomplished by deliberate efforts.

One gallon of gasoline will drive your boat four hours or more.

The water-proof, accessible, shock-proof, special flywheel, high tension magneto, with variable spark, is a constant guarantee of efficient ignition.

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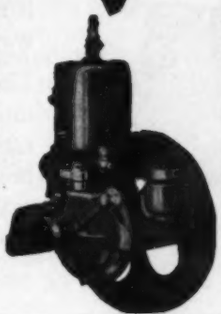
These prominent features, together with the new ARROW tilting device, which permits your boat to pass over obstacles and to beach easily, are only an introduction to the many which make the two-cylinder ARROW worth more—yet it costs no more.

2 H.P. K-1 Single-Cylinder Inboard Engine for small craft. Weight 36 lbs.



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1 Cylinder 3 H.P. Detachable

The Original Porto Detachable is now manufactured exclusively by us, all rights, patents and titles having been purchased from the Waterman Motor Company.

The automobile control of the Porto gives perfect freedom for trolling. Any speed, either forward or reverse, is secured by simply changing the position of the reversed propeller controlled lever. Speed is regulated by the carburetor's throttle and by advancing and returning positions of the timer lever as the speed requires. The Porto is equipped with a rudder absolutely independent of the motor, by which the boat may be steered from any position, whether or not the engine is running.

Also Model K-2 Two-Cylinder 5 H.P. Weight 60 lbs.

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FOUR CYCLE MARINE MOTORS

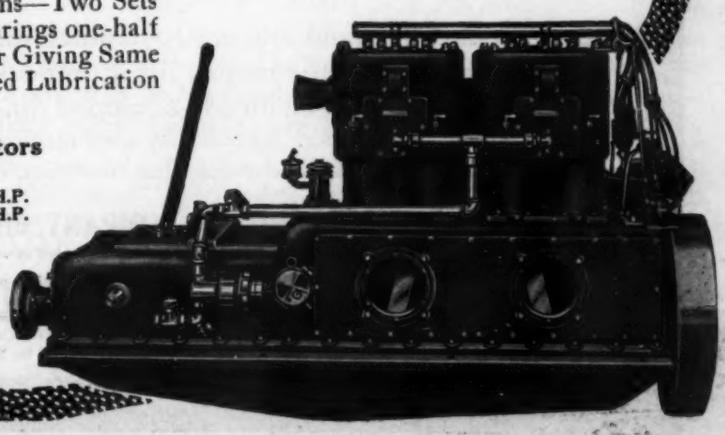
Built up to a Standard—not down to a price

Model "D-4" Medium Heavy Duty Motor

36 Horse Power **Bore 4½ inches** **Stroke 8 inches**

A strictly high grade medium heavy duty motor that has earned a reputation for unfailing dependability and economy—a reputation not surpassed by any other motor, regardless of price. Every refinement of design and every improvement in manufacturing processes developed during our sixteen years experience in motor building is concentrated in this Model "D-4" motor. We have spared neither time, labor nor expense in making it the finest motor of its type that can be produced.

Two Complete and Separate Ignition Systems—Two Sets of Plugs—Diameter of all Crank Shaft Bearings one-half of Cylinder Bore—Planetary Reverse Gear Giving Same Speed Reverse as Forward—Pressure Feed Lubrication through Drilled Crank Shaft.



"Hartford" 2-Cycle Motors

Model "X" Type

Single Cylinder— 5 H.P., 10 H.P.
Double Cylinder— 10 H.P., 20 H.P.

Manufactured by

The Gray & Prior Machine Company

56 Suffield Street,
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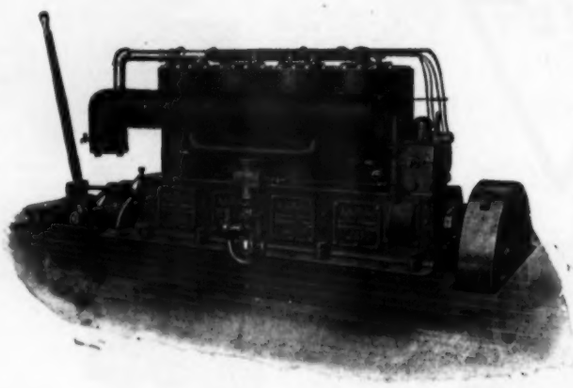
"The Automatic"



THE AUTOMATIC is a cruiser engine with practically unlimited capacity for hard work. It is built to give this service at the lowest operating cost.

For you, therefore, AUTOMATIC power has an actual money value—a saving that brings the first cost down to a remarkably low figure. It means longer service—satisfactory in every way.

The AUTOMATIC is built in two to six-cylinder models, 30 to 250 H.P. The cylinders are separate and independent; the bearings are of bronze—removable and adjustable; the oiling system is dependable at all speeds; the engine is controlled by an enclosed governor.

Write for Specifications

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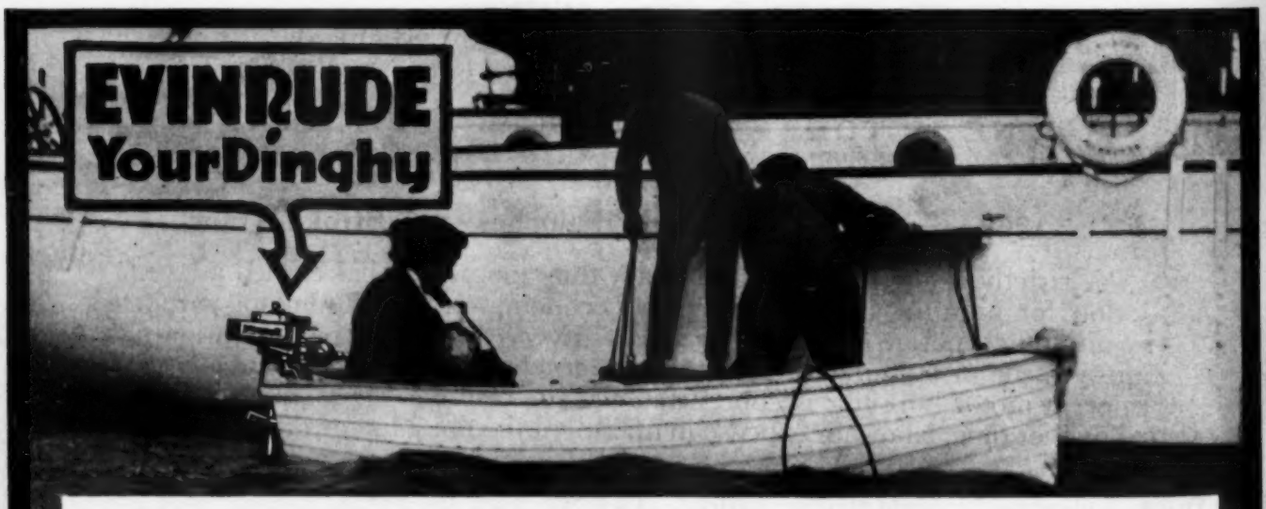

and have a convenient and easily-handled auxiliary power tender. No davits required—just detach the motor, lift it on deck and pull the dinghy aboard. Valuable for cruising—an Evinrude-equipped dinghy can be beached without interference by rudder or propeller. Extensively used for fishing, clamming and "running around." Write for new catalog. Special folder describes rowboats, canoes, skiffs and accessories.

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Also manufacturers of 2 and 5 H. P. 2-cycle Inboard Motors, for launches, canoes, dinghies, tenders.

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DETACHABLE ROWBOAT & CANOE MOTOR
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YOU WILL ENJOY AERO-MOTORING

SPEED *SIMPLICITY* *SATISFACTION*

It has been proven beyond a doubt that an Aero-propeller direct connected to an engine will drive a boat faster than an under-water screw propeller. In recent demonstrations the Aerothrust bucked river currents against which experienced oarsmen could make no headway.

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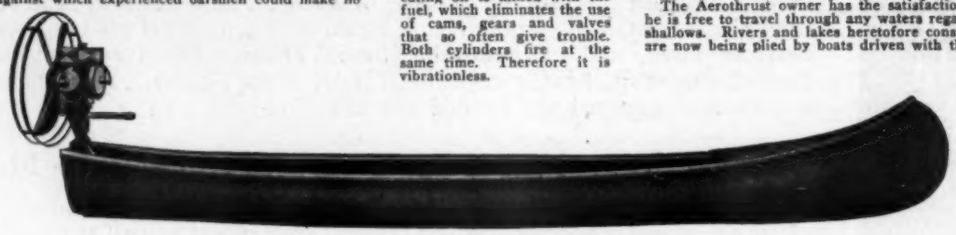

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The Kennebec type 4-A square stern canoe, especially designed for the hunter, fisherman or pleasure seeker, making the out-of-the-way places easily accessible. Equipped with a 3 H.P. Aerothrust outboard motor. It is the ideal outfit for SPEED—SIMPLICITY—SATISFACTION.

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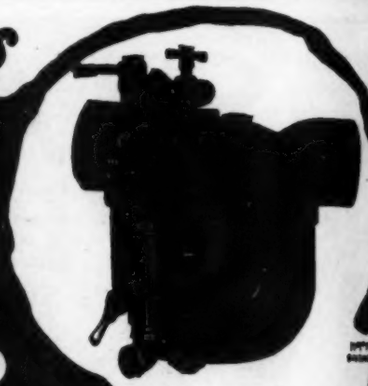
King of Marine Carburetors

KINGSTON

THE WORLD'S MOST POPULAR CARBURETOR



The Kingston is today the world's most popular carburetor.

So far as we know we are now producing more carburetors than other manufacturer in this line, and this is not the time of year for our maximum production.

The demand is keeping our plant busy night and day,—and we are the largest carburetor manufacturers in the world.

There is a real reason for Kingston popularity. It is the all-around efficiency of the Kingston Carburetor.

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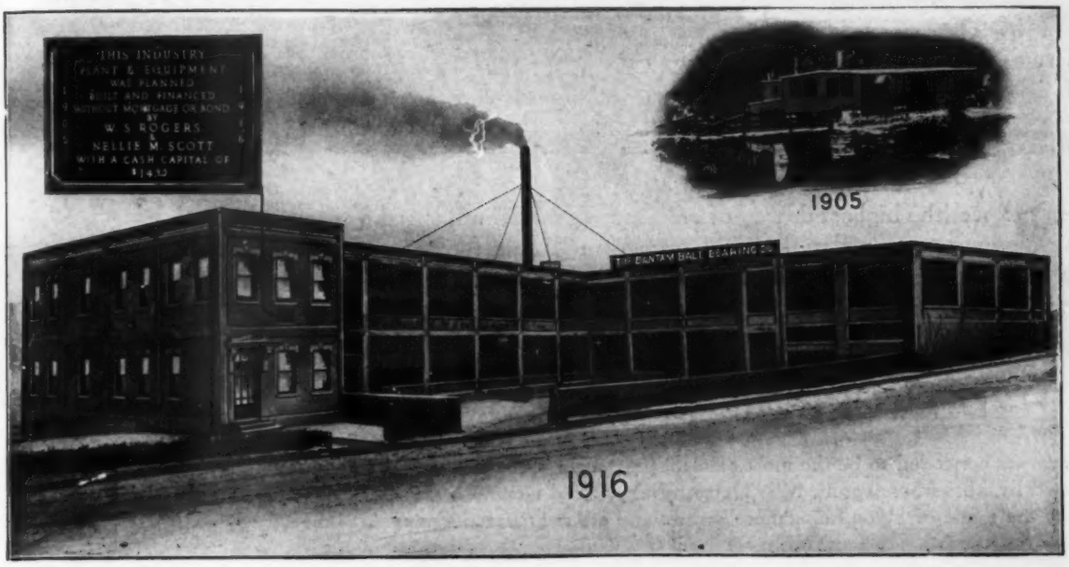

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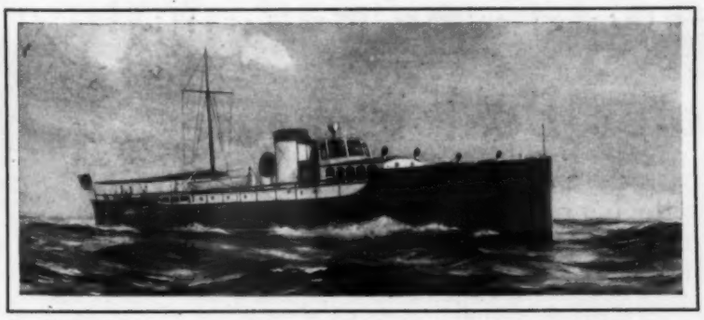

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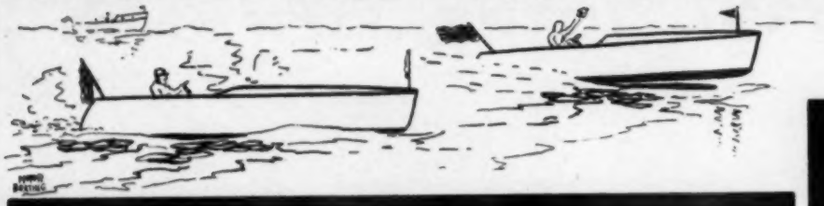

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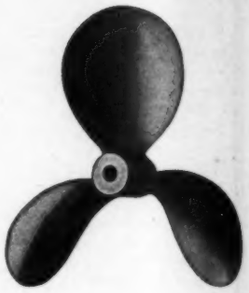
HYDE

YOU can't expect the highest degree of efficiency or maximum speed from your boat unless you have a propeller that will transform **ALL** of the power of your motor into direct driving thrust. The percentage of boats that are operating with misfit wheels is surprising. Perhaps yours is one. Do you know that it isn't? There is a propeller that will give you maximum speed and efficiency, and that is a



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HYDE wheels are conceded to be the most efficient propellers ever designed for any type of hull. They are used by Miss Minneapolis, Miss Detroit, Baby Speed Demon II and many other famous boats. They are made of Hyde manganese bronze and are guaranteed against breakage.

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The book contains interesting information on motorboat engines. It describes and pictures accurately the complete line of L-A inboard and outboard motors for launches, row-boats, work-boats, etc. It provides you with complete particulars covering the
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Your outfit is no stronger than your reverse gear.

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MOTOR BOAT LIGHTING OUTFIT

We assume you are pretty well posted on marine equipment of various kinds. But unless your boat is equipped with a complete electric lighting outfit, you don't really know the value and convenience of electricity.

And unless your lighting equipment is a **HENRICKS EUREKA** Outfit, you don't know what perfect lighting service you can secure at trifling first cost and practically no expense for operating.

The Henricks Eureka is the standard electric lighting system for motor boats. It is installed on hundreds of boats, including all sizes from a little launch or runabout to a 60-ft. cruiser. Outfits can be supplied to operate as many lights as may be desired.

Remember, we are electric boat lighting specialists. We have been manufacturing ignition and lighting devices for seventeen years. Let us recommend an equipment for your boat and quote prices before you buy.

Magnetos for Ignition and Lights Direct, from $10.00 Up

Lighting Outfits, consisting of Generator and Storage Battery, $40.00 and Up

Switchboards $12.00 and Up

Write today for catalog which gives details and prices

HENRICKS MAGNETO & ELECTRIC CO.

Formerly Henricks Novelty Co.

HOME OFFICE: 1255 St. Paul Street, Indianapolis, Ind.

120 Liberty Street, New York City

24 California Street, San Francisco, Cal.

"SANDS" Sanitary Fixtures

Their quality, construction and appointments are the recognized standard of the world

"Iowa"—Plate S-2040
(Patented—Copyrighted)

The "IOWA" Pump Water Closet. Vitro-Adamant extra heavy oval hopper bowl, 4" supply and waste pump. Price with oak seat and cover, pump rough with polished trimmings $85.00

We recommend a pair of seacocks for the installation of all pump closets

Plate S-127

The "Granby" Round Way Sea Cock. For large closets.

1 inch.....$4.00
1½ inch... 5.50
1½ inch... 7.00
2 inch.....11.00
Sizes 2½" and 3" also made.

"Florida"—Plate S-2015
(Patented—Copyrighted)

The "FLORIDA" PUMP WATER CLOSET with extra heavy oval Pedestal Vitro-Adamant Bowl, 4" combined supply and waste pump with check valve in waste arm. Complete with oak seat and cover pump rough with finished trimmings $100.00

"Winner"—Plate S-2061
(Patented—Copyrighted.)

The "WINNER" Pump Water Closet, Vitro-Adamant Round Hopper Bowl, oak seat, N. P. brass hinges, 2½" supply and waste pump, "Sands" Special quick opening supply valve.
Plate S-2060 Fixture as described with oak seat.. $19.00
Plate S-2061 Fixture as shown with oak seat and cover $20.00

Plate S-126

The "Glenora" Composition flat way sea cock.

	Price
¾ inch	$2.25
1 inch	3.00
1½ inch	5.25
2 inch	8.00

Sizes 2½" and 3" also made.

"Knockabout"—Plate S-34
(Patented—Copyrighted.)

The "Knockabout" Improved Pump Water Closet, Vitro-Adamant round flushing rim bowl. 2½" combined supply and waste pump, "Sands" Patent Automatic Safety Supply Foot Valves, and "Sands" Patent Back-water Check Valve.
Pump rough, finished trimmings, oak seat and cover.. $52.50
Mahogany seat and cover, add 1.50
Weight, net, 45 lbs; gross, 75 lbs.

Plate S-3190

The "Nano 12" Vitro-Adamant Corner Lavatory with N. P. Brass Pump and waste fittings and N. P. Full "S" Trap.... $25.50

Plate S-3196

The "Nanoo" Lavatory; same as Plate S-3190, except with faucet instead of pump and without trap $10.75

Plate S-145

The "Hobron" Vitro-Adamant Folding Lavatory, N. P. brass combination self-closing faucet for hot and cold water. Complete..... $45.00

Weight: Net, 43 lbs.; Gross, 75 lbs. Dimensions: Height over all, 20½ in.; width, 16¼ in.; depth open, 17 in.; depth closed, 7 in.

Plate S-147

The "HOBRON" Lavatory, similar to above except fitted with pump instead of faucet $50.00

Plate S-3183

The "Manatee 14" Vitro-Adamant, Flat Back Lavatory, with N. P. Basin Pump and waste fittings; no trap $23.75

Plate S-3180

The "Menard" Lavatory, same as Plate S-3183, except with faucet instead of pump and with N. P. Full "S" Trap.... $14.75

Plate S-750

Double Acting Brass Auto Bilge Pump, 15 inches long under spout and fitted with 5 feet of rubber hose.

No. 1—1½" diam..	$3.00
No. 2—1½" diam..	4.50
No. 3—1½" diam., 24" long, with foot rest	5.50

Plate 130¾-B

Cast Bronze Round Raised Strainer.

2½"	$0.35
3"	.50
4"	.85
5"	1.00
6"	1.50
7"	2.25
8"	3.00

Insist on "Sands" fixtures; they are safe and reliable.

Plate S-709

All Brass Galley Pump, 1½ in. Cylinder, reversible handle with shut-off cock. Polished $8.50
N. P. all over.. 10.50

Owing to the abnormal high prices and scarcity of material and labor, selling prices necessarily are advanced to meet conditions, ranging from list prices as net up to 50% advance over list based upon cost.

Large assortment of Closets, Lavatories, Deck Plates, Ventilators, Port Lights, Basin and Galley Pumps shown in Catalog "R." Free upon application

1849 **A. B. Sands & Son Co.** 1917

"Sixty-Eight Years of Quality"

LARGEST MANUFACTURERS IN THE WORLD OF

Marine Plumbing Specialties

22-24 VESEY STREET NEW YORK, U. S. A.

ENGINES

KENSINGTON

METAL PRODUCTS

HIGH QUALITY LOW PRICE

Kensington Two Cycle Engines are actually **the most carefully machined engines in the United States.** Simply because they are built by the machine trade students in the great Vocational Schools at New Kensington, Pa. Practically every part is machined to one-thousandth of an inch accuracy, then tested with limit gauges by mechanics of 15 years' experience.

No manufacturer could afford to build an engine as carefully as the Kensington.

2½ H. P., Bare Engine	$32.95
Engine with Plug and Mixer	38.60
Engine with Plug, Mixer, Electrical and Boat Equipment	43.35

Also made in 5 H. P. model.
Backed by signed guarantee of the New Kensington School District.
Write today for full details.

The Motor Specialties Co.
Box 1610 Pittsburgh, Pa.

2½ H. P.
5 H. P.

ESTABLISHED 1844

A. S. MORSS CO.

132 FEDERAL STREET BOSTON, MASS.

Carry the largest line of Marine Hardware, Brass and Galvanized in the States. Also paints and varnishes all the popular makes. We quote prices on application. Let us know your wants.

A. S. MORSS CO.

132 FEDERAL STREET BOSTON, MASS.

TOPPAN BOATS

If you want the best boat for your money, and the most seaworthy boat you can get at any price, just buy a Toppan Boat. Designed and built by the experts of the Massachusetts coast—men who have spent their lives on the water.

TOPPAN WINNERS FOR 1917

Dory Launches—18, 20, 22, 26 and 30 ft. Sailing Dories—14, 16, 18 and 21 ft. V-Runabouts—14, 21, 27 and 30 ft. Gov. Model Launches—22, 25 and 30 ft. Swampscott Power Dories—18, 20, 22, 26 and 30 ft. Rowing Skiffs, Swampscott Dories. Raised Deck Cruisers—27 and 30 ft. Special Outboard Motor Boats—$85 and up. Special Cape Cat Sail Boats—21 and 24 ft., with or without power.

Write today for our new 1917 illustrated catalog.

TOPPAN BOAT MFG. CO.
81 Washington Street, N., Boston, Mass. FACTORY: MEDFORD, MASS.

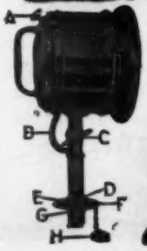
CELLO WIRELESS ELECTRIC LIGHTING SYSTEM

In the Cello "Wire-Less" Systems, there are no wires above the deck to connect or get water soaked

Cello Searchlights operate on six ordinary dry batteries, or on storage dynamo or generator. They throw such a powerful light that you can read

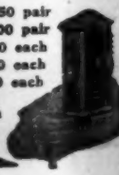
1000 FEET AWAY FROM THE LIGHT

The CELLO Running Lights have no wires above the deck. Merely a flush socket on deck which is absolutely waterproof at all times. Work on either one dry battery or a 6-volt system.



Class 1—Side Lights	$7.50 pair
Class 2—Side Lights	10.00 pair
Class 1—Combination Light	7.50 each
Class 2—Bow Light	5.00 each
Class 1—Stern Light	7.50 each
Class 2—Stern Light	5.75 each

CAMPBELL CO.
286 Commercial St.
BOSTON, MASS.
Write today for complete catalog



Pyrene

KILLS FIRE
SAVES LIFE

ANOTHER CLOSE CALL

On the water fire has you at its mercy. Gasoline fires are deadly dangerous.

Pyrene is sudden death to gasoline fire. It makes your motor boat safe even when a mile out. Any one who leaves shore in a motor boat without Pyrene takes a grave chance.

At all good Hardware, Auto and Marine Supply Stores.

Pyrene Manufacturing Company
New York
Every Appliance for Fire Protection

Lifts them up for painting

Rebabitting Stern Bearings

Lifts Engine

Pulls up on bank Anchors it

Pulls off when stuck

Here's the very thing you've wanted

There are so many uses this powerful and wonderful little machine can be put to on board *every* motor boat or yacht, that it will prove one of the *best* investments you ever made for equipment. It pays for itself in *one* season.

The response to our announcement last season proves that Pull-U-Out fills a long felt want. It is invaluable for pulling boats up out of the water during the season if they spring a leak, or for painting, etc. If the rudder needs fixing, or stuffing box is bothersome you will then have evidence of the *real* worth of Pull-U-Out.

When winter comes and your boat is out you can put Pull-U-Out in the tool box of your automobile and be prepared when you get stuck in the mud, skid into a ditch or overturn.

This clever and wonderful little machine consists of a winding drum, lever crank, 40 ft. of steel cable, two 7 ft. chains and 3 anchoring stakes. The whole outfit goes into space 4 x 8 x 14 inches and weighs only 28 lbs. It has a dead weight lifting capacity of 2,000 lbs. and will pull 100,000 lbs. on wheels. Larger sizes have greater capacity.

With this pigmy with the giant's strength you can unaided, pull your boat out or lift it for painting and repairs. It's easy to rig it up as shown. Pull-U-Out is equally useful in pulling boats ashore and anchoring them, and for pulling them off the rocks or mud.

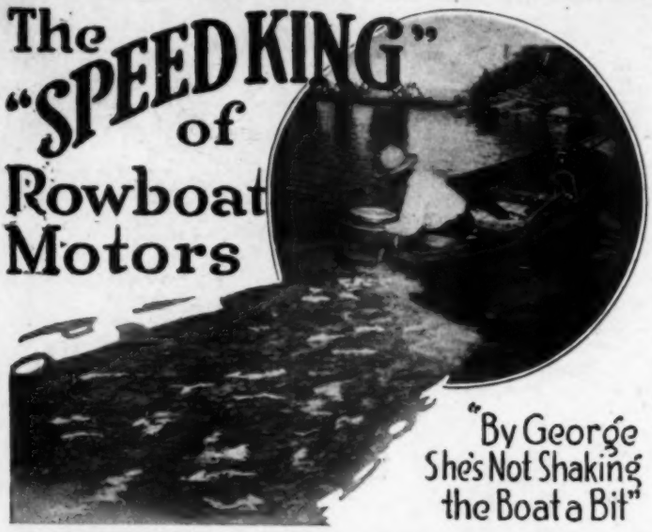
Sold on the make good basis

You take absolutely no risk in buying a Pull-U-Out. We guarantee to refund your money in full if it does not come up to your expectations. Leading dealers are selling Pull-U-Out on these terms. If your dealer doesn't stock it write us.

Interesting Booklet Free
Tells all about Pull-U-Out, how and why it works and the hundred and one uses it can be put to.

Pull-U-Out Sales Co., 2039 MARKET STREET ST. LOUIS, MO.

The "SPEED KING" of Rowboat Motors



"By George She's Not Shaking the Boat a Bit"

The "Koban" CAN'T Shake the Boat

To taste the real joys of boat motoring—to feel the thrill of smoothly "skimming the seas" at a spanking speed *without a particle of jolting or vibration*, see that your boat is fitted with

The Great 2-CYLINDER **KOBAN** ROWBOAT MOTOR

The 2-cylinder, ***vibrationless Koban*** can't shake the boat because both cylinders fire simultaneously, neutralizing all shock. It's the only rowboat motor that's made that way.

The ***Koban*** is a speed marvel and makes from 10 to 12 miles an hour on a good boat. It takes a husky launch to trim it. Starts easily—reverses by simply pressing a button—wonderfully economical of fuel consumption—special tilting device operates perfectly in "shallows" and beaches easily.

"My boat is 16 ft. long and makes better than 12 miles," is the "bouquet" from Madison, Wis.

"There is no vibration at all" reports Rigaud, Canada.

Koban Boosters Circle the Globe

Enthusiastic users of Koban Motors reflect the name and fame of this marvelous little speedster in all parts of the civilized world. Practically every country on earth has paid tribute to the supermerits of this little giant of rowboat motors.

"KOBANS" are in use in all the nations of North and South America—in Cuba, Hawaii and the Philippines—in Germany, England, Ireland, Scotland, Wales, Norway, Sweden, Denmark, Switzerland, Holland—in France, Spain, Russia, Italy, Belgium, Austria-Hungary, Portugal—in China, Japan, Asia, Siam, Australia and New Zealand—in far-off India, Persia, Arabia, Turkey, Greece, Egypt and the Congo States of Africa.

Send for catalog and learn the *Wonders* of the *1917 Models*.

Agents wanted at every water point. Write us for details.

KOBAN MANUFACTURING CO., 246 South Water Street MILWAUKEE, WIS.

We also make a 2-cylinder, 3 H. P. vibrationless INBOARD MARINE ENGINE for small launches, canoes, etc. Write for Circular No. 80.

TRADE MARK

SMITH'S SPAR COATING

90 Years Experience in Every Can

WE GUARANTEE

absolutely that this varnish is well-aged and made of nothing but hard fossil gums of superior grade, finest oil of special refining and pure spirits of turpentine, no rosin, no substitutes.

The most perfect finish for spars, deck houses, decks and all wood and metal work exposed to excessive changes in weather and temperature.

It is pale, has good body and is easy working, brilliant and most durable.

AQUATITE

(Formerly MARINITE)

for all wood and metal work generally "awash" and anywhere for "hurried" work.

It will not turn white under water.

EDWARD SMITH & CO.

Varnish Makers for 90 Years

Main Office and Works

Long Island City, New York

P. O. Box 1780 New York City

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"SHIP AHOY!"

"I heard that cry several times in the fog and fortunately the night was quiet. You may be sure that we were all glad when we were able to help him out.

"It seems that his dry batteries had given out on him suddenly, and it might have been dangerous, as he was some six miles out and it was after 11 o'clock at night.

"We happened to have an extra Hy-Watt lying in our boat, and although it had probably been soaking in water for a week or so, due to a leak I had not discovered, we gave him the Hy-Watt and his motor went off with a hum."

* * * *

These facts should convince you of the reliability, and even the necessity of having a dry battery that is not affected by water in the slightest.

There is a Hy-Watt that has been under water for seven months and it has not been affected by the water.

It would pay you to investigate this battery. Ask your dealer about it, or write

THE HY-WATT BATTERY CO.

1974 East 66th Street
Cleveland

"Combine Pleasure with Safety"

"Just what I want. Had a close call a while back. I was working on my engine, cleaning it up, and there was a lot of oily waste around.

"Some ashes spilled from my pipe, the waste caught fire and it blew into a blaze quick.

"I never thought a fire could take hold the way that fire did. I emptied all my sand boxes, then grabbed a pail and commenced sousing things with water.

"Gasoline on top of the bilge next caught fire and we were about to abandon the ship when a friend stepped aboard and with a few quick strokes smothered the fire with his FYR-FYTER extinguisher.

"It gave me the scare of my life. Had the fire occurred away from shore and no Good Samaritan been present, we would all have been drowned.

"No more makeshifts for me. I want FYR-FYTER with its continuous stream, easy pump action and panic proof handle. There is no pleasure in being without the use of your boat while it undergoes repairs, even though you should be fortunate enough to have it insured, which I didn't."

Fyr-Fyter NEVER FAILS

Quenches gasoline fire—oil—grease—any origin

Bear in mind, too, these exclusive features:

A year's insurance against theft—*free.*

A guarantee of free replacement or repair if found defective due to workmanship or material.

Each machine tested thoroughly before, during and after assembly.

Approved by the Underwriters' Laboratories, Inc.

Ask Your Dealer

Hardware stores, auto dealers, mill supply houses, ship chandlers sell them. But demand FYR-FYTER—get the extinguisher that *lasts.* Combine *pleasure* with *safety.*

THE FYR-FYTER CO.

World's largest exclusive manufacturers of one-quart fire extinguishers.

109 Patterson Bldg., Dayton, Ohio

THE HAND OF SAFETY

Popularity

The Universal Motor made a hit right from the start.

It seemed to be just the size and type of motor the boatman had in mind.

The Universal embodies every modern engine refinement that could be wished for in a motor.

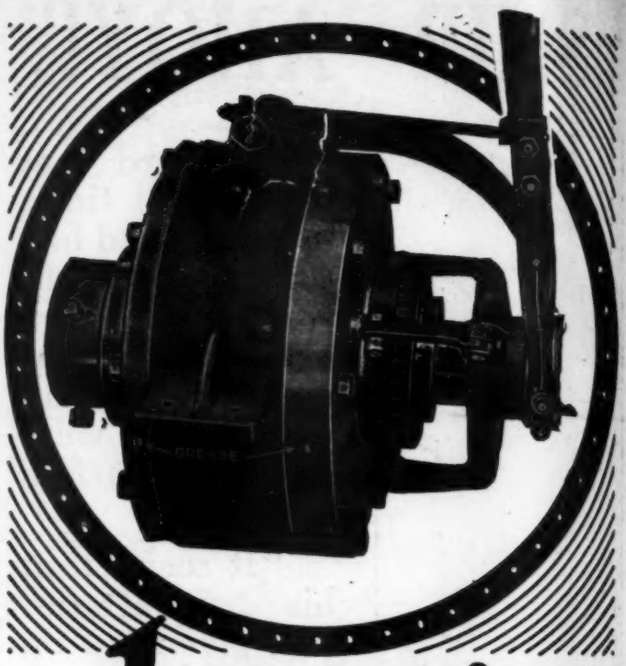
Its ease of starting makes it a favorite among the ladies.

Its capacity to use kerosene brings it into extensive use in countries where gasoline is at a premium.

Its speed range from trolling to racing is an important feature, and its electric motor-like smoothness of operation attracts everyone.

Send for bulletin No. 25.

UNIVERSAL MOTOR CO.
OSHKOSH, WIS.



JOE'S
REVERSE GEAR

Just say "Joe's Gear" when you order your new engine. On many engines you would get Joe's Gear as regular equipment, but on the others it will be supplied if you ask for it.

Joe's Gear is the one which has proved so satisfactory on all different types of boats. It is used on Miss Minneapolis, the world's record holder; Miss Detroit, the former record holder,—on big freighters and auxiliaries, passenger boats, cruisers, and express boats. There never was a more reliable gear made.

Joe's Duplex Drive is the only heavy duty gear with nearly the same speed ahead and astern that does not depend on locked gear teeth for forward drive. Equally suitable for heavy boats and racing craft.

Joe's High Power Gears, for High and Medium Speed. Joe's High Speed One-Way Clutches, for hydroplanes and speed boats; smallest size transmits 30 H.P. at 1,000 R.P.M. Also a lower priced clutch for general use. Safety rear starters—proof against back-kicks.

Write to-day for catalog.

The Snow & Petrelli Mfg. Co.
154 BREWERY STREET
NEW HAVEN, CONN.

AGENTS: J. Kling & Co., 10 Church Row, Limehouse, E. London, Eng.; L. H. Coolidge Co., Seattle, Wash.; W. C. Disbrow, Jr., 71 Cortlandt St., New York; W. E. Goshenaur, 631 Arch St., Phila., Pa.; Wood Vallance & Legat, Vancouver, B. C.; A. R. Williams Machinery Co., Toronto; W. D. Foreman, 1425 Michigan Ave., Chicago; Pike Motor & Yacht Co., 371 St. James St., Montreal, Canada.

"Miss Minneapolis" powered with a high speed Sterling motor. Equipped with a Joe's Duplex Drive Gear.

NIAGARA

The Complete Boat

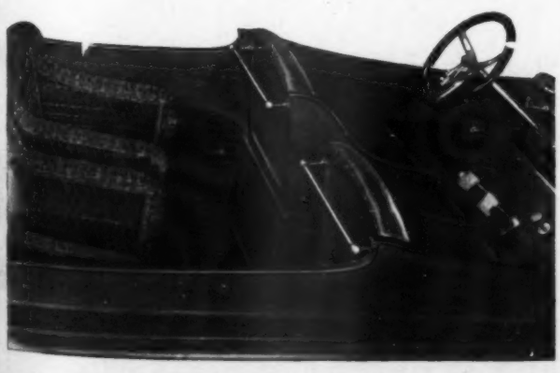
You can "put yourself in this picture" just as soon as you desire. .

IMMEDIATE DELIVERY

Niagara Runabouts, the aristocracy of small power boats, can be purchased now for immediate delivery. A limited number of 25, 28 and 32 foot boats are on hand, but it is only a question of time before this stock will be exhausted. If you want one of these seaworthy "Niagaras," noted for their sturdy construction, grace of lines and perfection of finish, it will be necessary to "speak for it" quickly.

Write for illustrated folders and complete information before "your boat gets another bid."

NIAGARA MOTOR BOAT CO.
210 Sweeney Street, North Tonawanda, N. Y.



Showing some of the refinements of the "Niagara": comfortable upholstered seats, wicker chairs, robe rails, lockers and ice compartments underneath seats; all furnished as a part of the regular equipment.

McQUAY-NORRIS LEAK-PROOF PISTON RINGS

Whatever the Motor

—there is an exact size of this ring made for it.

Every dealer, repair and garage man has this McQuay-Norris piston ring dimension book.

It supplies them with the piston ring sizes of all makes and models of motors. It enables them to fit your particular motor with McQuay-Norris LEAK-PROOF Piston Rings of exact dimensions—at once. Note that—*exact; at once.*

Genuine McQuay-Norris LEAK-PROOF Piston Rings are made and carried in stock in over 2,000 different sizes, including all over-sizes in both widths and diameters. Each and every size is accurate to one-thousandth of an inch; perfect in fit and finish. No other make of piston ring has anything like so wide a range of stock sizes.

There are complete service stocks of McQuay-Norris LEAK-PROOF Piston Rings in all jobbing centers from coast to coast.

Therefore, order and insist on Genuine McQuay-Norris LEAK-PROOF Rings. The only rings which will ensure the maintenance of good compression, save fuel and oil, and minimize motor wear and carbon trouble.

As an assurance of getting the Genuine have your repair man send you the empty containers—one container for each ring—with his bill.

Send for FREE Booklet

"To Have and to Hold Power"—the standard handbook on gas engine compression. Simple, sensible, informative—of great value to anyone who owns or operates any motor or engine. Write Department B.

Manufactured By

McQuay-Norris Mfg. Company
St. Louis, U. S. A.

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New York	Chicago	Philadelphia
Pittsburg	San Francisco	Los Angeles
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St. Paul	Atlanta	Denver
	Dallas	

Canadian Factory:
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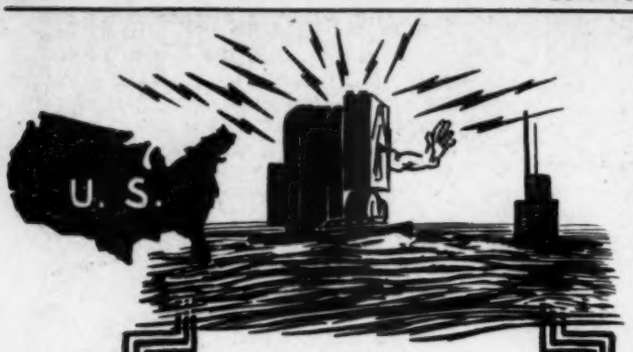
The Genuine—packed this way for your protection

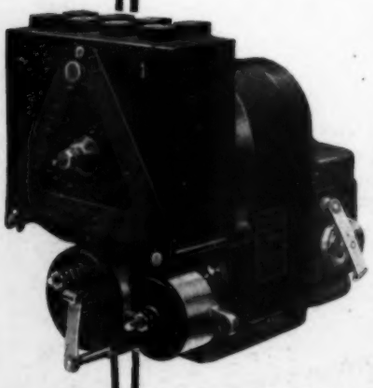


The Berling
Does Its Bit Against the Subs

The Berling sparks the "Chingachgook," one of the originators of the "Mosquito Fleet" of submarine chasers.

Hundreds of these similar speed boats guard the Atlantic Coast. A large proportion are sparked by the Berling because its spark is fat and steady.

The Berling is standard on many of the best marine engines. On other good engines it can be had for the asking — it costs **you** no more.



Ask for the BERLING

Ericsson Manufacturing Company

1105-1145 Military Rd. Buffalo, N. Y.

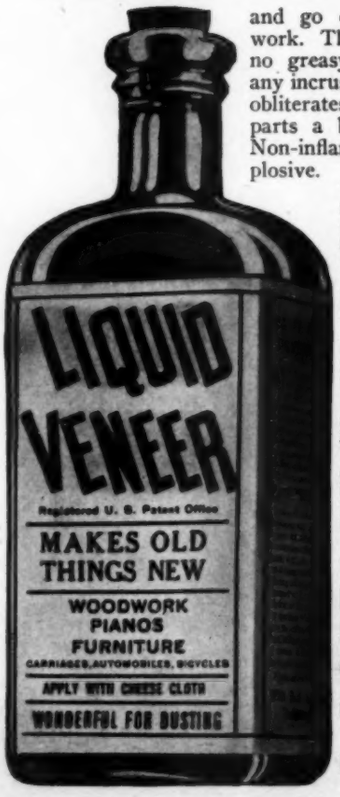
Berling Magneto
Worth More Does More

Saves Expensive Varnishing

JUST a few minutes' time, just a little Liquid Veneer, and your bright work will stay glossy and shining, dull finishes will regain their newness, the varnish will be nourished and kept from cracking, all spots and foreign substances will vanish, and you will save time, bother and money every way you may figure it.

Simply moisten a piece of cheese cloth with

LIQUID VENEER



and go over the bright work. That's all. Leaves no greasy film, removes any incrustation or bloom, obliterates scratches. Imparts a beautiful polish. Non-inflammable, non-explosive.

Think of it! A $1.00 bottle often means a saving of $100.00 in refinishing. Used on thousands of motor boats and in millions of homes. SPECIAL OFFER. Send $1.00 for a quart bottle and we will send you, *free*, in addition, a regular 25c L-V "Crepette" Dust Cloth, unequalled for applying Liquid Veneer. Seize this opportunity, open to you for a limited time only.

BUFFALO SPECIALTY COMPANY

Buffalo, N. Y. U. S. A.

Bridgeburg, Ont. Canada

DELCO-LIGHT

ELECTRICITY FOR ANYONE ANYWHERE

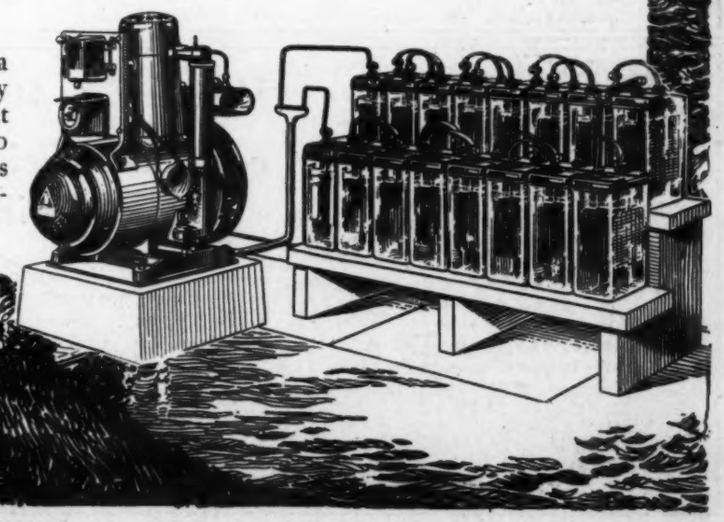
DELCO-LIGHT will light up your summer cottage, your grounds and your docks, brilliantly and economically. It will light your house boat or your yacht. It has ample capacity to light house and outbuildings, and to furnish power for pump, washing machine, refrigerating machine, vacuum cleaner, electric fan, etc.

Write for the Delco-Light book

The Domestic Engineering Company
Dayton, Ohio

Offices in all principal cities

DELCO-LIGHT is a simple, compact highly efficient electric plant that requires little or no attention, and that runs on kerosene, gas or gasoline.



VIPER
Reg. U. S. Pat. Off.

SEA SLED
Reg. U. S. Pat. Off.

VIPER SEA SLED

HICKMAN PATENTS

Latest Type Sea Sleds for Aviation Division, United States Army

Able, seaworthy boats, designed for rescue work in open water.
Length, 28 feet. Weight on trials, 7800 pounds.

Two six-cylinder 6″ x 6″ engines

GUARANTEED SPEED, 35 STATUTE MILES PER HOUR

Speed Shown on Official Trials, 43.54 Statute Miles Per Hour

Run from Gloucester to Boston, 28 miles, 18 miles of which is open water, in a stiff chop. Army officials aboard. Revolutions, 1200. Time, 48 minutes.

INCOMPARABLY THE FINEST SEA BOATS IN THE WORLD

MURRAY & TREGURTHA CO.
340 West First Street
South Boston, Mass.

THE VIPER CO., Ltd.
Pictou, Nova Scotia
Canada

SAND-DAB, 16½′ long, 4½′ beam, 11″ draft, 4-cylinder, 4-cycle motor housed in amidships giving range of speed from a trolling speed to 12 miles per hour.

VALLEY BOATS

combine Efficiency and Satisfaction

32 FT. VALLEY DAY CRUISER

Write for list or come and inspect our new and slightly used boats which are ready for immediate delivery. See our 45-mile Hydro Runabout.

Let us help you plan your boat for use in Southern waters. We have many attractive designs and now is the time to get started. You can have a real Quality boat and still save from 10% to 40% if you buy your boat from us. VALLEY boats are Quality boats—up to the minute in design and having the finest of materials and workmanship.

CRUISERS, RUNABOUTS, HYDROPLANES, ROWBOATS

We specialize in V-Bottom boats and Round Bilge boats embodying the efficient principles of the V-Bottom designs. We will recommend the type best adapted to your requirements. Write today.

VALLEY BOAT COMPANY **River Street, Saginaw, Mich., U. S. A.**

Frisbie VALVE-IN-HEAD MOTOR

LINKED TOGETHER

Frisbie—Quality—Power

The name **FRISBIE** assures you satisfaction first of all. You can depend upon it without the slightest hesitation.

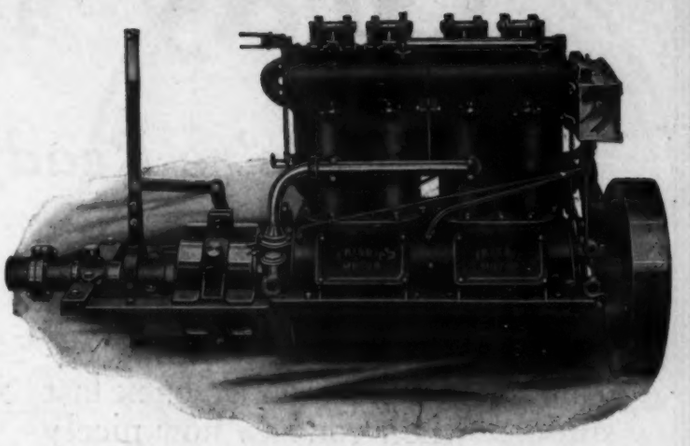
LINKED TOGETHER with this name are the two necessary and most important requirements: **QUALITY—POWER.**

Look well to these essentials—choose your motor as carefully as you do your boat. The motor has the greater strain.

FRISBIE Motors come the closest to perpetual motion ever produced in a marine engine. They keep running. They don't fail you at the critical time. They are built for years of faithful service. For cruising or commercial boats, their superior has never been built.

The valve-in-head design means more power, greater elasticity and less trouble than you get in the other kind. Ask us to send you the names of **FRISBIE** owners and learn what they think.

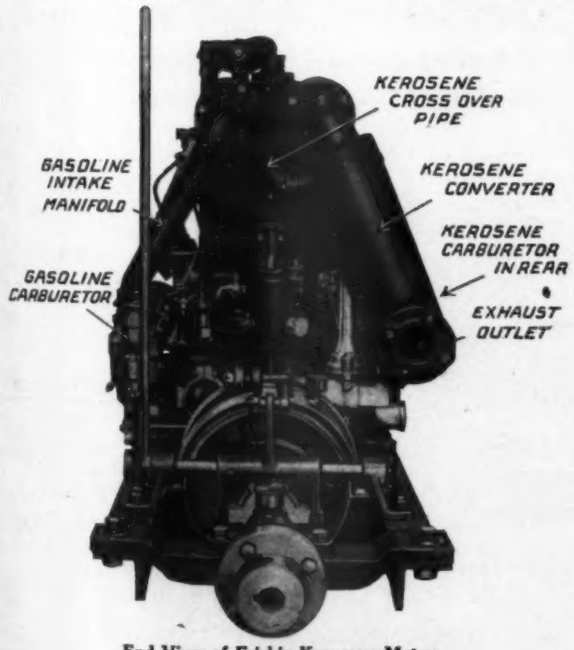
Send for catalog of **FRISBIE** Engines from 1 Cylinder to 6 and 3 H. P. to 75.



FRISBIE FOUR

20-30 H. P.	Same design—30-40 H. P.
Speed, 600 to 800 R. P. M.	650 R. P. M.
Minimum Speed, 150 R. P. M.	150 minimum speed.
Weight, with reverse gear, 725 lbs.	Weight, with reverse gear, 1200 lbs.
Length, with reverse gear, 59¾ in.	Length over all, with gear, 72¾ in.

FRISBIE—THE FRIENDLY MOTOR



End View of Frisbie Kerosene Motor, showing the separate manifolds and carburetors on opposite sides. 3 cyl., 18-25 H. P., 6" x 6" bore and stroke.

KEROSENE

This motor runs on kerosene as dependably and with 95% of the efficiency of any gas engine that ever turned a propeller. The control is flexible and there is no smoke or odor. Finally—and this is the chief advantage—it means a big saving on fuel.

The motor has two carburetors and two intake manifolds, one each for gasoline and kerosene—the only arrangement that produces economical results.

The motor runs well on gasoline or kerosene, or on a combination of the two. Our special system of lubrication works perfectly with kerosene fuel. This motor has been thoroughly tested for over two years and is absolutely free of experimental features.

Write to us for full details and proof.

THE FRISBIE MOTOR CO.

7 College Street MIDDLETOWN, CONN.

Frisbie VALVE-IN-HEAD MOTOR

Gray Motors

We're Ready—Are You?

IT'S human to put off doing things when our pocket-books are involved. Take that new engine for instance. Way back last summer when you saw how nicely the Gray motor in the other fellow's boat ran, how little fuel it used, and how seldom it required even a dime's worth of repairs or an hour's attention, you firmly decided that you'd have a Gray in your boat next season. During the long winter months you carefully selected the right model and horsepower to give your boat the greatest speed and efficiency. Then came a prolonged spell of cold weather and you didn't think of boating. This was followed by our entry in the war and your thoughts turned to other things. The order was not placed.

But the season approached steadily just the same and now it is upon us. The war has not affected your needs nor upset your boating plans. *AND YOU WANT THAT ENGINE NOW.*

The Gray Motor Co. can give it to you. Knowing something of human nature ourselves and realizing that marine motor production would be stimulated rather than curtailed by the war, we prepared to supply the sudden and heavy demand sure to come with the first warm days of summer. Long ago we laid in a big stock of raw materials (at much better than current prices) and now have plenty of finished engines to fill orders for the next two or three weeks. We can therefore supply you immediately with all models of 1917 Gray Engines.

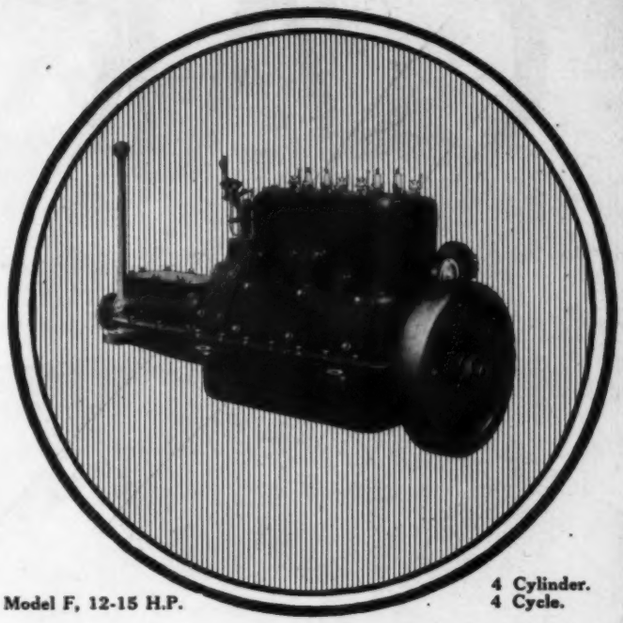
A Corner of Our Shipping Room.

Immediate Delivery

Shipment Absolutely Guaranteed Within Five Days After Receipt of Order

(Subject to Revision if Large Quantities of Our Product are Required by U. S. Government)

Anticipating months ago a shortage of material and a big demand, the Gray Motor Co. had the foresight and the capital to lay in the biggest stock of material ever accumulated for small marine motors. The result is we are NOW PREPARED to serve our customers with the utmost promptness at the following attractive prices:



Model F, 12-15 H.P. 4 Cylinder. 4 Cycle.

THE COMPLETE GRAY LINE

TWO CYCLE

Model U, 3 H.P., 1 Cyl. For Fresh Water, $ 74.00; Salt, $ 84.00

Model U, 5½ H.P., 1 Cyl. For Fresh Water, 110.00; Salt, 126.50

Model U, 6 H.P., 2 Cyl. For Fresh Water, 144.00; Salt, 159.00

Model U, 11 H.P., 2 Cyl. For Fresh Water, 184.00; Salt, 207.00

FOUR CYCLE

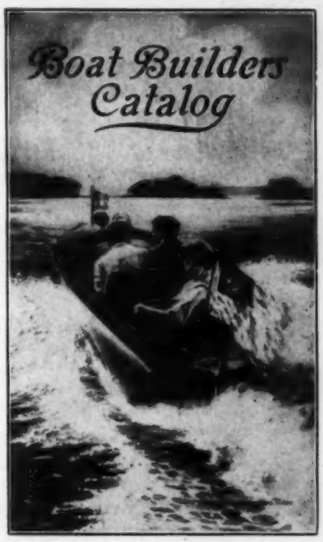
Model F, 12-15 H.P., 4 Cyl., $225.00 Magneto, $50.00; Built In Reverse Gear, $50.00

Model D, 10-12 H.P., 2 Cyl., $200.00 Magneto, $50.00; Built In Reverse Gear, $50.00

Model D, 20-24 H.P., 4 Cyl., $300.00 Magneto, $50.00; Built In Reverse Gear, $55.00

Let Us Help You Choose the Best Boat for Your Requirements.

The 1917 Boat Builders Catalog depicts the products of over 100 prominent boat builders throughout this country. It shows every size and type of motor craft afloat. It contains a directory of over 400 of America's leading boat builders, all of whom endorse the Gray. Let us send you a copy of this valuable book with a copy of our complete engine catalog.



HERE'S THE REASON—

The Gray Motor Company Are the Largest Builders of Small Marine Engines in the World

Your order or your request for catalog will receive equally prompt attention and careful consideration. Address

GRAY MOTOR COMPANY, 336 Oakland Ave., Detroit, Michigan

W. C. Disbrow, Jr.....71 Cortlandt St., New York City, N. Y.
W. H. Moreton.....214 State St., Boston, Mass.
W. L. Masters & Co.....229 N. State St., Chicago, Ill.
W. E. Gochenaur.....631 Arch St., Philadelphia, Pa.
The Lassell-Sterling Co., Inc.....121 Light St., Baltimore, Md.
Arthur Duvic.....130 Chartres St., New Orleans, La.
S. V. B. Miller.....72 Marion St., Seattle, Wash.
Fellows & Stewart, Inc.....Wilmington, Cal.

CARBON

Remove it Yourself for 25¢

JOHNSON'S CARBON REMOVER

YOU can't expect engine efficiency or fuel economy if your cylinders are allowed to cake up with carbon. It overheats and pitts the valves, pre-ignites the gas, pounds out the bearings and clogs the piston rings so that compression is lost and power diminished. No wonder an engine gets weak and troublesome toward the end of a season.

But don't have your engine overhauled this winter—at least, not until you have tried this. Clean out the carbon, tune up the adjustments, and unless you have some loose bearings, you will find overhauling an unnecessary expense.

Johnson's Carbon Remover is the latest and most perfect solution of the carbon problem. It is **easy to use, inexpensive** and **absolutely harmless.** It will save you twenty times its cost every time you use it.

You Can Do This Yourself

Pour an ounce or two of Johnson's Carbon Remover into each cylinder at night, it will dissolve the hard, gummy binder which holds the carbon together. In the morning, run your engine a few minutes and the carbon will blow out through the exhaust.

Johnson's Carbon Remover will cut down your gasoline consumption 12% to 25%. This is not merely a claim—it has been demonstrated on hundreds of motors.

Absolutely Guaranteed

We absolutely guarantee that Johnson's Carbon Remover cannot harm the motor, no matter how it is used. It doesn't affect the lubrication or interfere with the oil in the crank case. No acids.

S. C. Johnson & Son, Dept. M B. 6 Racine, Wis.

Get it From Your Dealer

or

Send the Coupon Today

S. C. JOHNSON & SON,
Dept. MB6, Racine, Wis.

Gentlemen:—

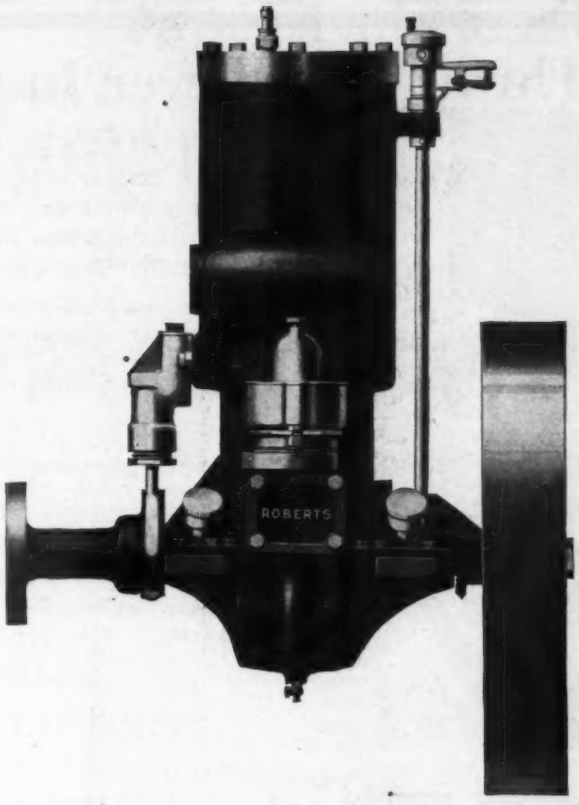
I enclose $1.00 for which please send me by prepaid express enough Johnson's Guaranteed Carbon Remover for cleaning an ordinary four cylinder engine three times.

Name .....

Address .....

City & State .....

My Dealer is .....



Model "S" 8-10 H. P. Fisherman's Engine

THE Roberts Heavy Duty Motor for Work Boats is a mighty strong, sturdy and dependable power plant. It will run, and keep on running, under the hardest of working conditions. It will operate on either gasoline, kerosene or Californian Distillate. Compact, powerful, sturdy but light and with Roberts well-known qualities built right into it, this Work Boat Engine will prove an excellent investment for you.

You can have this engine equipped with either Jump Spark or Make-and-Break Ignition. Lubrication is entirely automatic—Just mix your lubricating oil with your gasoline and the motor gets just the proper lubrication at all speeds. A highly efficient system that relieves you of all worry on this score.

Net price on this 8-10 H. P. Motor with Regular Engine Equipment and Jump Spark Ignition - - $150.00
With Make-and-Break Ignition - - - - - 165.00

ROBERTS MOTOR MANUFACTURING CO.

1105 Roberts Bldg.

SANDUSKY, OHIO

PARAGON REVERSE GEARS

Yes, You Can Throw Your Lever In GRADUALLY

THERE'S no jumpy, jerky start when your motor is equipped with a Paragon. No getting under way as if you were hitched behind a skittish horse. The Paragon allows you to get under way slowly, smoothly, gradually.

Its great friction area, obtained by its multiple discs (see arrow), allows your gear to take up its motor's load gradually. You couldn't do this with any other type of transmission without cutting up your friction surface.

See the other refinements of Paragon construction. Note the direct-line drive that transmits your motor's power from your engine gear through four equidistant pinions *direct* to the propeller gear,— no lost power. See the ingenious stop links on the fingers that lock the gear securely in either position.

Better still, ask your friend at the Yacht Club how well his Paragon has served him.

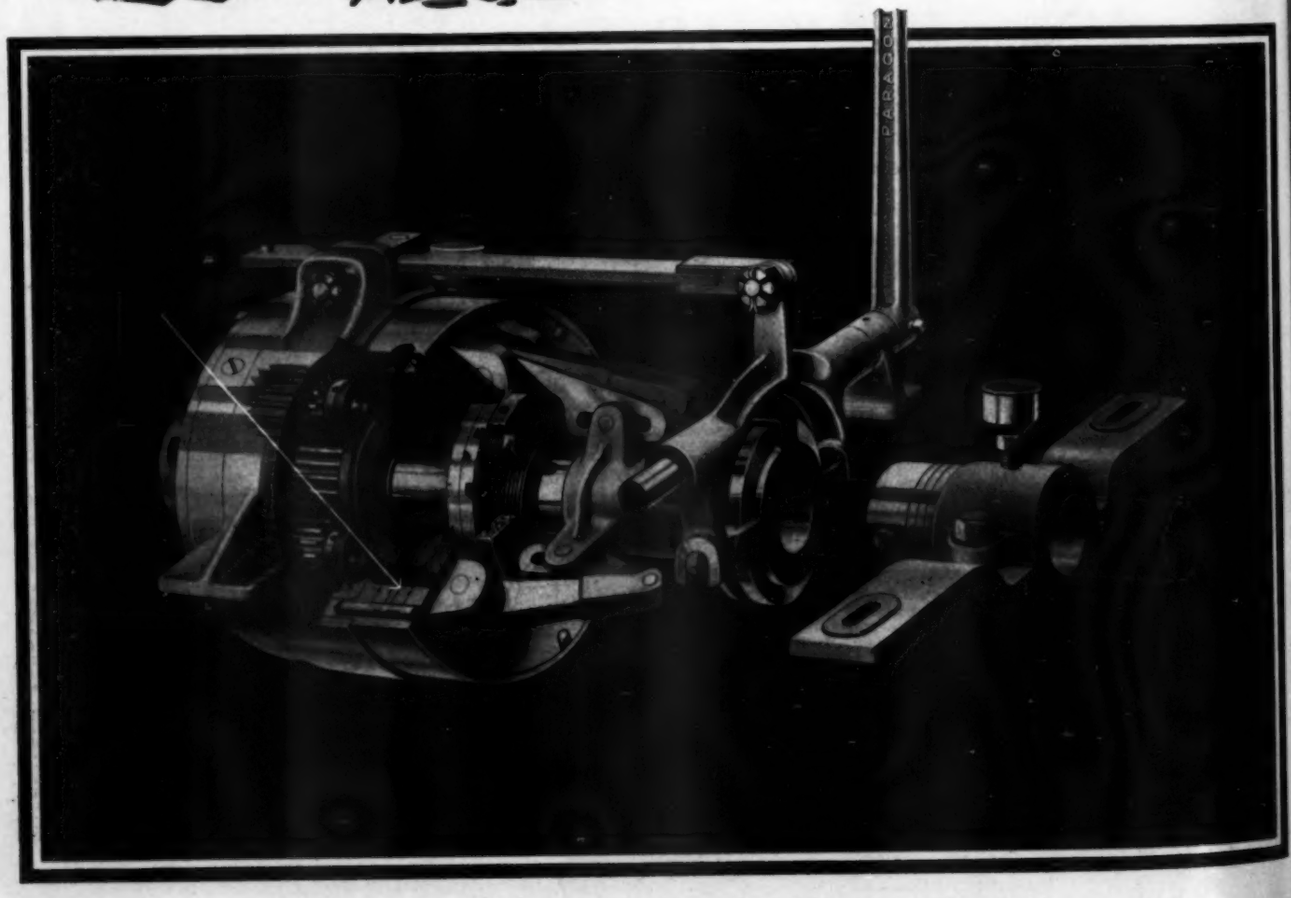
Then look up the standing of the engine builders who use Paragons exclusively. You're safe in following their lead.

SEND FOR CIRCULAR NOW

PARAGON GEAR WORKS

Evans Stamping & Plating Co.

Cushman Street TAUNTON, MASS.



Proper Lubrication

THE man who owns a motor boat and realizes the important part which lubrication plays in the operation of the motor will take no chances with the motor oil he buys.

He will see to it that at all times his motor is lubricated only with the best oil obtainable—such an oil, for instance, as

TEXACO MOTOR OIL

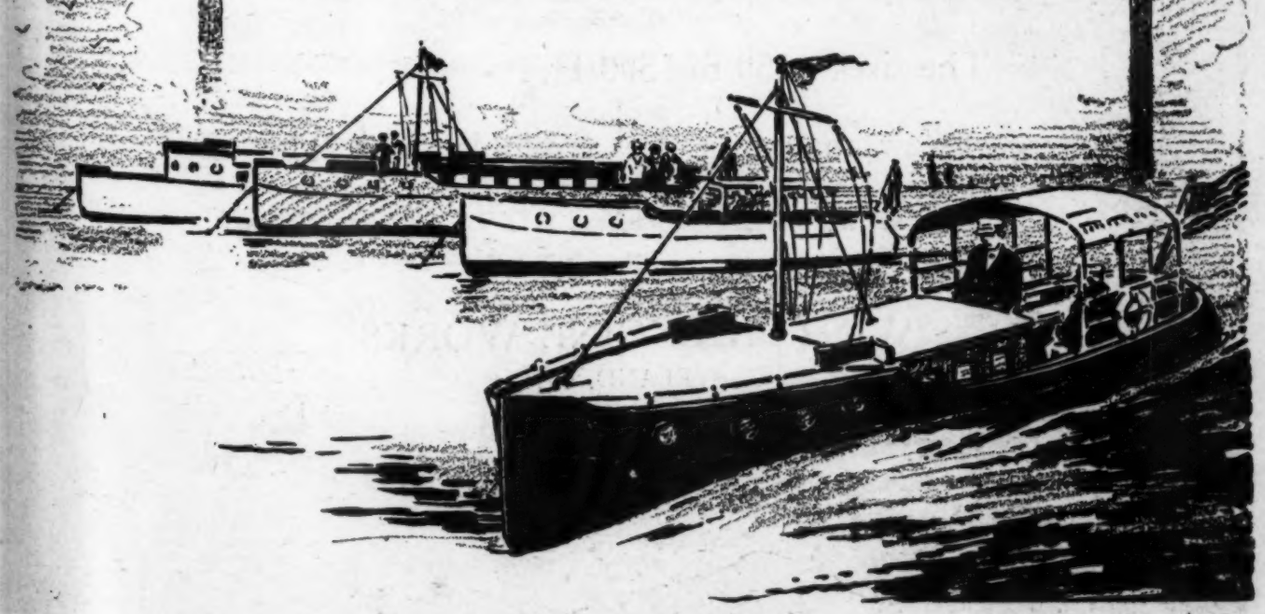
When you use Texaco you take no chances. You can rest assured that your motor is receiving proper lubrication.

This oil has no superior among motor lubricants. The most painstaking methods of refining applied to an inherently rich crude oil, produce a lubricant that meets satisfactorily every demand which can be put upon it.

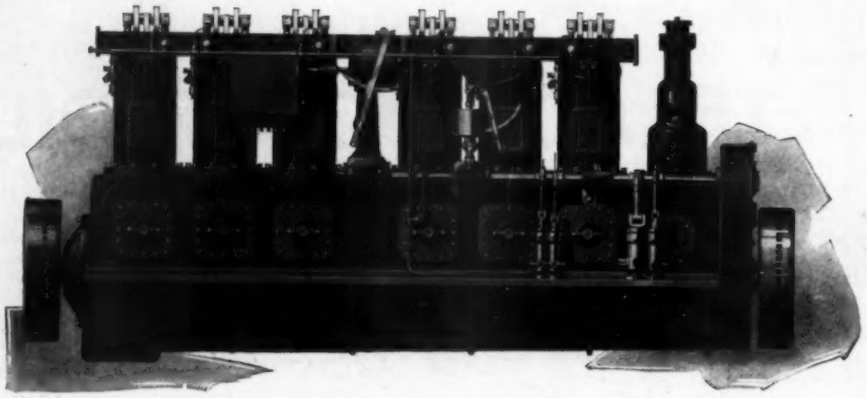
Texaco Motor Oil reduces friction to a minimum thereby enabling your motor to operate at its highest efficiency. It gives a perfect seal between piston and cylinder and allows no gasoline to leak into the crank case. Due to certain basic qualities it *cannot* deposit a hard carbon crust in the motor.

When you buy motor oil buy Texaco. It can be obtained at many stations along the water front. You will recognize it by its clear, clean, uniform color.

THE TEXAS COMPANY
New York Chicago Houston
DISTRIBUTING OFFICES IN MOST CITIES



WINTON OIL ENGINES



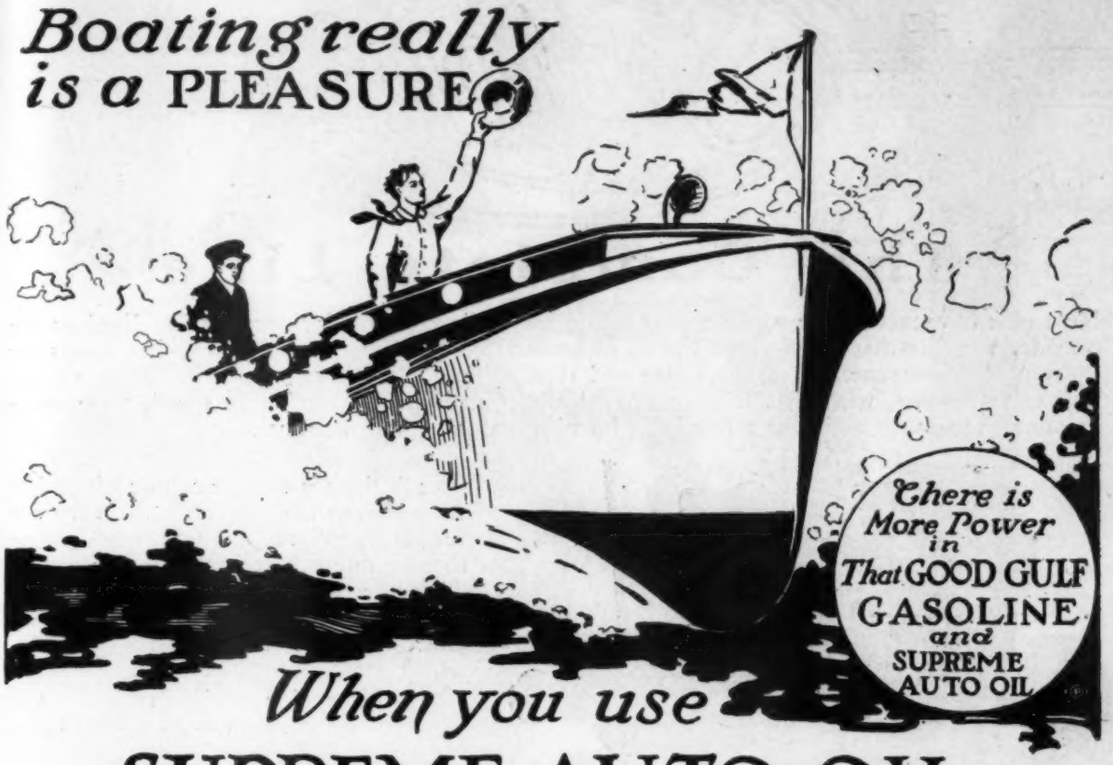
First offered to the public one year ago this company has since that time contracted for and is building an aggregate of 25,000 B. H. P.

A REMARKABLE TRIBUTE TO A REMARKABLE PRODUCT

The sizes—150 to 1500 H. P.

A few machines are available for 1917 delivery.

WINTON ENGINE WORKS
CLEVELAND, OHIO



SUPREME AUTO OIL
and
That GOOD GULF GASOLINE

THAT GOOD GULF GASOLINE is straight run, containing no kerosene or casing head mixtures, and carefully filtered for the elimination of any foreign matter.

It is used by the United States Navy in its submarines and all other gasoline propelled craft. This, in itself, is the best evidence of its superior quality.

We feel justified in saying that there is More Power in THAT GOOD GULF GASOLINE. More power means more mileage at a lower cost with less carbon, less strain upon your motor and a consequent saving on the general upkeep of your engine.

Put THAT GOOD GULF GASOLINE in your tank, and feel the exhilaration of More Power in your motor.

GULF REFINING COMPANY

The Largest Independent Refining Company in the World

GENERAL SALES OFFICES: PITTSBURGH, PA.

DISTRICT SALES OFFICES:

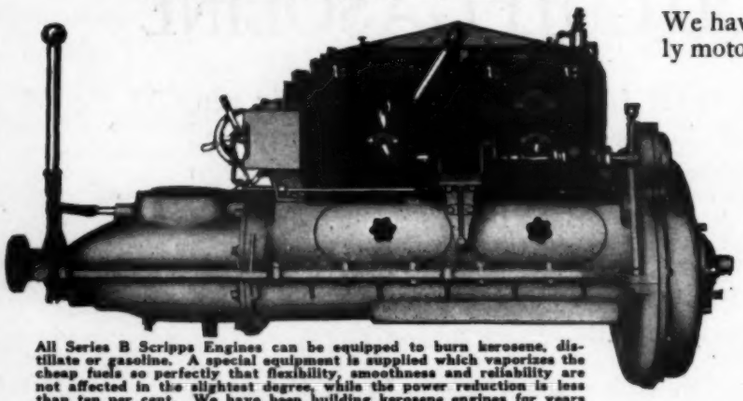
New York Philadelphia Boston Atlanta Tampa New Orleans Houston

Scripps

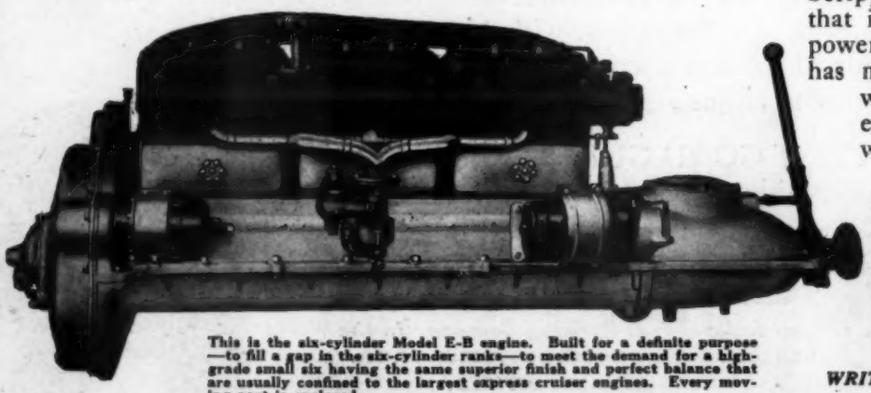
The Complete Line

Next in importance to the well-known quality and reliability of Scripps Marine Engines we consider the fact that the Scripps line is so unusually complete. It includes power plants for every marine purpose and of every size and type, from 10 H. P. to 125 H. P. They are all four-cycle engines, with two, four or six cylinders, medium duty and high speed, some using gasoline exclusively and others fitted for burning kerosene and distillate.

"Scripps Special." 15 H.P., $326.00. A moderate priced four-cylinder valve-in-head unit power plant for open boats and cruisers from 17 to 28 ft. Simple, rugged and economical, it gives exceptional service in medium duty or speed work. Magneto and reverse gear are included at the figure quoted. Weight, 425 lbs.



All Series B Scripps Engines can be equipped to burn kerosene, distillate or gasoline. A special equipment is supplied which vaporizes the cheap fuels so perfectly that flexibility, smoothness and reliability are not affected in the slightest degree, while the power reduction is less than ten per cent. We have been building kerosene engines for years and now have more than two thousand in service.



This is the six-cylinder Model E-B engine. Built for a definite purpose—to fill a gap in the six-cylinder ranks—to meet the demand for a high-grade small six having the same superior finish and perfect balance that are usually confined to the largest express cruiser engines. Every moving part is enclosed.
Medium Duty, 40-45 H.P. High Speed, 50-55 H.P.

The Scripps is the one engine which has done more than any other to prove the reliability of the modern high grade marine motor. It is the engine which drove the 35-footer "DETROIT" across the Atlantic, making 6500 miles from Detroit to St. Petersburg.

It is the engine which took Larsen through the Niagara Gorge. It is the engine which has performed exceptional tasks the world over. It has won many contests and trophies, and secured highest honors at the world's great expositions.

We haven't been satisfied to build merely motors. We haven't taken one design and reproduced the same parts in several different sizes. Each Scripps Engine is designed for a certain type of boat or a certain class of service. Each Scripps Engine is the leader of its class—as perfectly adapted to its use as though it were the only model we were building.

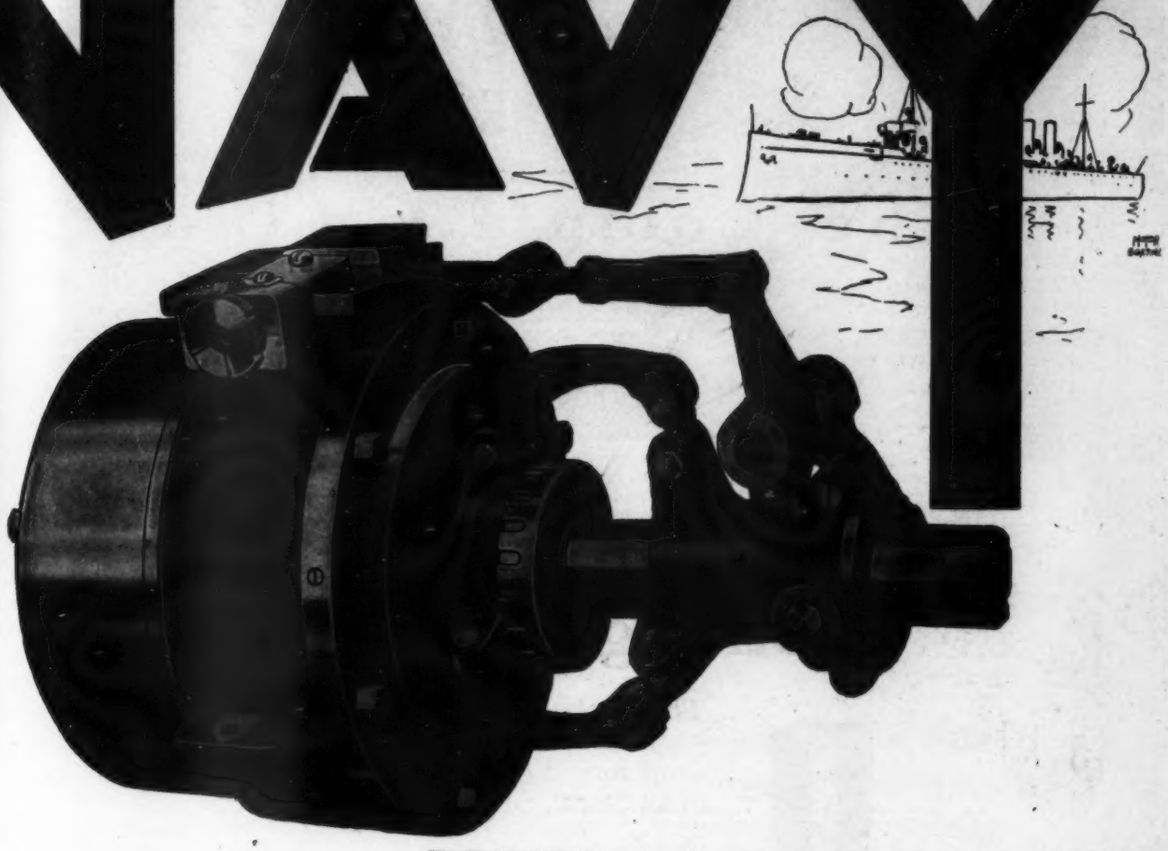
For many years the name Scripps has stood for all that is best in the marine power field. This name has never been associated with an unsuccessful engine, and it never will be.

Buy a Scripps Motor this year. Whether you are building a new boat or refitting your present one, if you have a power problem Scripps will solve it for you.

WRITE TODAY FOR LATEST CATALOG

SCRIPPS MOTOR CO., 631 Lincoln Ave., Detroit, Mich.

NAVY



GEAR

THE NAVY Gear has been purposely designed to meet the United States Navy requirements.

THE NAVY Gear is the ONLY gear made today that carries the power forward entirely independent of all gearing, thereby eliminating all strain, and preventing any crystallization of the gear teeth.

Write today for complete description and prices.

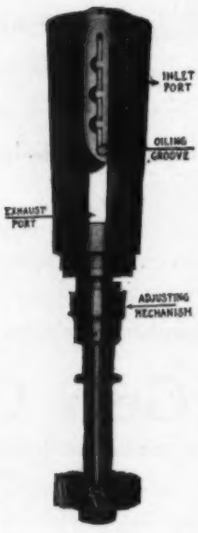
The Navy Gear Company

JOE PETRELLI, General Manager

NEW HAVEN :: :: CONNECTICUT

Not only does it fully meet Government requirements, but it is of sufficient size and strength to so prevent wear as to meet with the most demanding service required by all manufacturers of engines. Navy Gear manufactured by JOE PETRELLI.

Strong In Construction
Strong In Action



The crank shaft and connecting rods of the 50 H.P. Silent Valve-Driggs Engine are drop forged of heat-treated Chrome Vanadium Steel.

The main bearings are supported by upper crank case and are held in rigid alignment by generous ribbing.

This engine is able to deliver its 50 H.P. efficiently and continuously because its three rotating valves have large intake and exhaust ports which provide for unrestricted passage of gas and purity of the mixture due to thorough scavenging.

Unlike the chattering poppet valves, our silent gas-tight valves are *noiseless*—a welcome luxury.

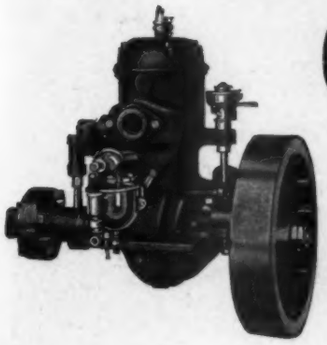
The New Silent Valve-Driggs Marine Engine is backed by our extensive experience in making ordnance for the government.

Write for illustrated catalogue

DRIGGS ORDNANCE CO.

120 Broadway *Dept. B* **New York**

SILENT VALVE DRIGGS



Consult a Specialist

About an Engine for Your Small Boat

For that new boat, you want an engine of just the right power, weight, size and speed to give you the exact kind of service required of it. Unless you already know what you need to secure the highest efficiency, *Don't Guess—Consult a Specialist Who Knows* what you need and can supply it.

You may already own an engine which is unreliable; maybe reliable, but too light or too heavy for your boat; or possibly it is unsuitable in other ways. *What's the Use of Having an Unsatisfactory Outfit?* Consult a specialist to find out what you need to get fixed up ship shape—and then get it.

Our eighteen years' concentrated effort and experience, studying and supplying the varied requirements of small boats, surely justify our calling ourselves specialists. Besides our 1917 line of Eagle Engines proves our claim.

CONSULTATION, ADVICE AND LITERATURE ABSOLUTELY FREE.

We do not supply engines without charge, but we do give you the best possible value for your money in every Eagle Engine you buy.

Send for new catalog today.

THE STANDARD COMPANY

Torrington, Conn., U. S. A.

Why Put in a Whole Engine

What's an engine for, anyway?

It's to propel the boat, make you independent of all weathers, and enable you to get "there and back" with the maximum degree of comfort, convenience, economy and safety.

If you don't get those things, to the maximum degree, you get only a part of an engine—one that doesn't do its whole duty.

A Ferro engine is a whole engine, to be depended upon for satisfactory service and —above all—reliability under all conditions.

Why? Because Ferros are designed and built that way. We've been making them —and watching them in performance—for fifteen years. In all that time we don't believe we have neglected a chance to improve them in any way that would put more actual, honest, dependable value in them. We believe they are as nearly "trouble-proof" as internal-combustion engines can be—and we believe we can prove it to you by records of service that you can't question.

> We refer you in all confidence to any Ferro owner. You will have no trouble in finding one, because Ferros are running in practically all the navigable waters of the earth. And we know what he is most apt to say, because we know Ferro engines, and because we know the amount of satisfaction they are giving, day in and day out, in sunshine and storm, everywhere.

Fourteen models, 2-cycle and 4-cycle, 3 h.p. to 50 h.p.; 2-cycle models burn gasoline or kerosene; ask for Catalog 1062. Then there's the Ferro Rowboat Motor (with Kingston carburetor and Bosch Magneto) that's well worth knowing about; Catalog 1061. Write for the Ferro catalogs—and learn about this *dependable* line.

THE FERRO MACHINE & FOUNDRY CO.
610 Hubbard Avenue **Cleveland, Ohio**

MARINE ENGINES
FERRO

C&W WIRELESS

The Navy's Nerves

What nerves are to the eyes and fingers, C & W WIRELESS is to aeroplanes and "scouts." Enabling them to communicate to the "brains" of the battleships the fact that the enemy are in sight and touch.

C & W WIRELESS-equipped cruisers are destined to play a high part in peace or war. To serve their country more effectively—if need be. Or their owners—as they would be served. With but one-tenth the parts—one-fourth the weight—one-half the size and cost—*the C & W is 50% more powerful. By far the most efficient set.*

Can be easily installed on any boat—by any competent electrician. Its operation can quickly be mastered by the owners or a member of the crew. C & W WIRELESS is as essential to classy cruisers in peace time as to "wasps of the sea" in war.

Write today for de luxe booklet, describing the C & W SET for your boat.

CUTTING & WASHINGTON
INCORPORATED *Radio Apparatus*
26 Portland St., **CAMBRIDGE, MASS.**

5

Champion Toledo

Dependable Spark Plugs

First Because Better

Champion Spark Plugs won first place by sheer merit.

You can depend upon them to *win* for you against the ceaseless pounding blast; against the extremes of ice and fire.

Their function is to cause combustion in the cylinders—what is *more* important in *your* boat?

Make sure of the best results from your boat by getting the plug with the name "Champion" *on the porcelain.* This is the way to avoid substitution.

Due to its vitality and stamina the Champion Spark Plug always sets off *all* the force latent in every cylinder-full of gas mixture.

Insist upon Champion Spark Plugs when you replace the spark plugs in your motor boat.

They are made in styles and sizes to give the most efficient service in any type of marine engine.

Every dealer has them.

Champion Two Piece Heavy Stone Price $1.25

Champion Spark Plug Company
3005 Upton Avenue
Toledo, Ohio

RUDDERS

MANGANESE BRONZE

For All Types and Sizes of Boats—Universal Struts

Write for COLUMBIAN ACCESSORIES Catalog

SPECIAL RUDDER OUTFITS FOR

HAND DESIGN V-BOTTOM BOATS

PEERLESS

Best Low Priced Propellers in the World

Made from Standard Columbian Patterns

FOR SALE AT ALL DEALERS—Or write for PEERLESS Price List

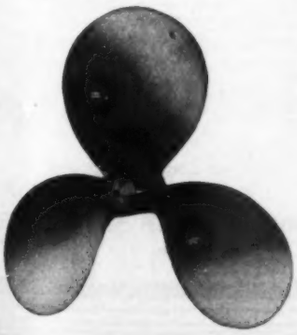
COLUMBIAN BRONZE CORPORATION

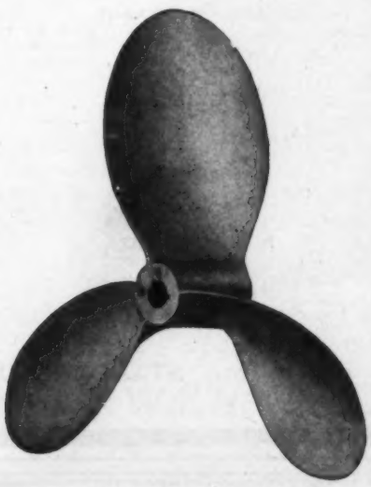
Successors to **Columbian Brass Foundry**

218 North Main Street, Freeport, Long Island, New York

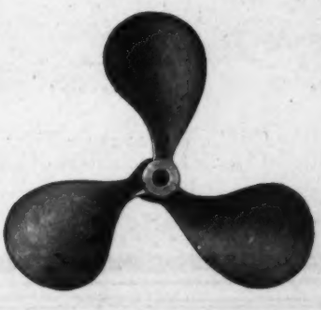
New York Branch for Local City Sales Only, Concourse, 50 Church Street

EVERYBODY KNOWS that an ordinary manufacturer is not equipped to make low priced propellers accurate to pitch and true screw.





EVERYBODY KNOWS that our Columbian patterns are accurate and right. Any propellers made from them must be accurate and efficient.



SOCONY MOTOR GASOLINE SUPPLY STATIONS

Where STANDARD OIL COMPANY OF NEW YORK

SOCONY MOTOR GASOLINE and POLARINE OIL and GREASES can be OBTAINED

NEW YORK BAY AND STATEN ISLAND

Bond & First Sts., B'klyn	Gowanus Canal
	S. O. Co. of New York
Ulmer Park	A. L. Anderson
Ft. 60th St., So Brooklyn	C. Poling
Sea Gate	Atlantic Yacht Club
Port Richmond, S. I.	S. O. Co. of New York
Tottenville, S. I.	
Stapleton, S. I.	(Schooner "Lawrence") Capt. Cattermole
Great Kills, S. I.	C. N. Solheim
Princess Bay, S. I.	C. C. Wincapaw & Son

EAST RIVER

Ft. N. 10th St., B'klyn Ft. N. 12th St., B'klyn Ft. E. 10th St., N. Y. City Ft. E. 23rd St., N. Y. City (The Anna Service) Ft. E. 120th St., N. Y. City	S. O. Co. of New York
Ft. Walnut Ave., Bronx	John Rehm
Kills, N.Y.	

LONG ISLAND SOUND

Flushing Bay (Corona)	John Mulcahy
Clason Point, Bronx	C. F. Quinn
City Island, N. Y.	Robert Jacobs A. Malakoff C. J. Lechler Wood & McClure
High Highland	Franz Marquard
New Rochelle, N. Y.	A. Larson
Mamaroneck, N. Y.	Daniel Forese
Port Chester, N. Y.	J. Kapp
College Point, L. I.	W. Needham H. Kramer
Port Washington, L. I.	Lewis Bros. Manhasset Bay Yacht Club
Glenwood Landing, L. I.	H. Berg, Jr. Fyfe & Hittorff
Oyster Bay, L. I.	Oyster Bay Canal & Dock Co.
Huntington L. I.	Charles Rosselle
Cold Spring Harbor, L. I.	E. Abrams & Son
Port Eaton, L. I.	Henry Steers Sand & Gravel Co.
Lloyd's Neck, L. I.	Henry Steers Sand & Gravel Co.
Northport, L. I.	S. Robbins & Sons
Port Jefferson, L. I.	W. E. Dayton
Greenport, L. I.	W. W. Griffin
Fishers Island, L. I.	A. H. Eldredge E. M. W. Ferguson
Shelter Island, N. Y.	N. P. Dickerson
North Beach, L. I.	Werner Machine Works

LONG ISLAND—SOUTH SHORE

Sheepshead Bay	Edward Berglund
Rockaway Point	P. H. Reid
Canarsie	Sutter Marine Equip't Co.
West Sayville	F. Ockers
Patchogue	W. R. Marran
Sag Harbor	John Murphy
Montauk	E. B. Tuthill
Freeport, L. I.	T. A. Cronin
East Rockaway, L. I.	S. S. Rhame
Amityville, L. I.	W. J. Ketcham
Bayshore, L. I.	T. F. Muncey & Son

HUDSON RIVER

Ft. W. 90th St., N. Y. City	P. R. Welch
W. 140th St., N. Y. City	F. R. Welch
Yonkers	S. O. Co. of New York Corinthian Yacht Club L. E. Hecht, at Germania Yacht Club
Tarrytown	Tarrytown Boat Club Tarrytown Yacht Club
Poughkeepsie	Poughkeepsie Chair Co.

HUDSON RIVER—(Continued)

Albany	Albany Yacht Club S. O. Co. of New York John Fisher	
Rondout	Newburgh Launch W'ks	
Newburgh	Mead & Taft Co.	
Cornwall	William Stilan	
Coeymans		
Nyack	Catskill	
New Hamburg	Hyde Park	Grand View
Hudson	Highland Falls	

NEW YORK STATE

Greenwood Lake, Orange Co., N. Y.

CONNECTICUT

Greenwich	Cos Cob	Stamford
Rowayton	So. Norwalk	Bridgeport
New Haven	Stony Creek	New London
Groton	Noank	Mystic
	Stonington	

ERIE CANAL

Rome	Utica	Syracuse
Rochester	Middleport	Lockport
Schenectady	Buffalo	Medina
Tonawanda	Albion	Brockport
	Little Falls	

LAKE ERIE

Buffalo	Dunkirk

OSWEGO CANAL

Fulton

NIAGARA RIVER

Buffalo (Foot Erie Street)

Tonawanda	No. Tonawanda

LAKE ONTARIO

Carlton	Summerville	Newport
Sodus Point	Point Pleasant	Charlotte
Sea Breeze	Manitou Beach	Oswego
Sacket Harbor		Henderson H'b'r

ST. LAWRENCE RIVER

Cape Vincent	Clayton	Ogdensburg
Thousand Is'd P'k	Alexandria Bay	Fine View
Chippewa Bay	Grindstone Isl'd	Point Vivian

LAKE GEORGE AND ADIRONDACKS

Caldwell	The Hague	Lake George
Saranac Lake	Lake Placid	Old Forge
Tupper Lake	Ticonderoga	Raquette Lake
Mountain Lake	Sabbath Day Pt.	Pilot Knob
Long Lake	Cleverdale	Kaatskill Bay
	Eagle Bay	

LAKE CHAMPLAIN

Plattsburg	Rouses Point	Burlington, Vt.
Westport	Ticonderoga	Whitehall
Port Henry	Essex	South Hero, Vt.
Vergennes, Vt.	St. Albans Bay, Vt.	

RHODE ISLAND

Newport	Wickford	Warren
East Greenwich	Pawtuxet	Bristol
Providence	Block Island	Oakland Beach

MASSACHUSETTS

New Bedford	Provincetown	Newburyport
Fall River	Hyannis	East Boston
Dorchester		Gloucester

NEW HAMPSHIRE

Lakeport (Winnipesaukee)	Portsmouth

MAINE

Portland	Kennebunkport — Rockland
Bath	Belfast — Eastport
Bar Harbor	Boothbay Harbor
Andrews Island	A. F. Rackliff
Atlantic	A. C. Smith E. R. Spuyling
Bailey's Island	E. E. Sennett
Bar Harbor	Fifield & Joy
Bass Harbor	Wooster & Thurston
Bay Point	Spinney Bros.
Beals	C. H. Beals
Bernard	Guy H. Parker
Bernard	Benjamin Murphy
Bernard	Willis Watson
Brooklin	A. E. Farnsworth
Bucks Harbor	R. H. Condon
Camden	Guy Ware
Castine	Wardell's Garage
Castine	W. H. Hoopey
Christmas Cove	W. P. Macfarland
Corea	Roy S. Stewart
Cranberry Isles	C. E. Spurling
Cranberry Isles	W. D. Stanley
Cunday's Harbor	A. J. Harris
Dark Harbor	H. C. Pendleton
Eagle Island	J. O. Quinn
E. Boothbay	F. L. Rice Motor Co.
Friendship	Jameson & Wotten
Isle au Haut	J. T. Conley
Isleford	Walter Hadlock
Jonesport, (West)	Hinkley-Stevens Co.
Jonesport, (West)	F. P. Smith & Co.
Jonesport, (West)	J. W. Lamson
Jonesport	Mansfield Packing Co.
Jonesport	The Mansfield Co.
Manset	J. A. Hopkins
Manset	B. H. Mayo
Manset	W. H. Ward
Matinicus	Henry Young & Co.
McKinley	Cunningham & Thompson
Medomak	M. A. Simmons
Monhegan Island	D. M. Davis
New Harbor	S. Tibbetts
Northeast Harbor	W. G. & L. F. Stanley
North Haven	F. A. Crockett C. S. Staples & Son
North Haven	W. S. Hopkins
Orrs Island	S. J. Prince & Son
Owls Head	M. T. Jameson & Son
Permaquid Beach	H. C. Partridge
Permaquid Beach	Geo. R. McLean
Port Clyde	The Port Clyde Cold Storage Co.
Prospect Harbor	F. A. Over
Rockland	Simmons, White & Co.
Rockland	S. O. Co. of New York
Rockland	Witham Bros.
Sargentville	W. G. Sargent & Co.
Sawyer's-Isle	E. H. Lewis
Seal Harbor	Seal Harbor Fish Co.
Sebasco	F. W. Ridley
Sebasco	A. C. Wallace
South Bristol	E. P. Thompson
South Blue Hill	Farnsworth Co.
South Blue Hill	F. B. Sylvester
South Brooksville	A. C. Conden
South Freeport	L. A. Dickson
Southport	Ralph Thompson
Southwest Harbor	A. E. Parker
Southwest Harbor	S. H. Mayo
Spruce Head	Freeman Elwell
Starbird Creek	Allen Bros.
Stonington	F. C. Dean
Stonington	T. Warren
Swans Island	Stanley & Joyce S. Morse & Son
Tenants Harbor	C. E. Wheeler
Thomaston	Dunn & Elliott
Tremont (West)	F. W. Lunt
Vinalhaven	Sanborn & Arey
West Small Point	H. Smith

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STANDARD OIL COMPANY OF NEW YORK

WE ARE PROUD OF "FALCON"

We are almost as proud of this cup winner "Falcon" as her owner, Mr. George L. Leonhard, of the Paterson Parchment Paper Company, Passaic, N. J. Mr. Leonhard is proud because he owns the finest family speed boat on Lake Hopatcong. We are proud because Falcon is one of our standard Fay & Bowen 30 ft. raised deck runabouts, powered with a

FAY & BOWEN ENGINE

In a series of six races this boat won three, one of them a 50-mile race for the silver cup shown above. In a long letter about his satisfaction with "Falcon," Mr. Leonhard said:

"In regard to the 50-mile race she ran perfectly, without a hitch for the whole distance. When we came in at the finish the people at the yacht club were surprised to see the machinery in such good shape after such a run, showing no marks of a hard race whatever, not being heated up any more than it would be after an ordinary run of five or ten miles."

If you want a comfortable family runabout that is fast enough and reliable enough to be the champion of her class in your club, you will be interested in "Falcon." The boat is 30 x 5½', smooth running and dry, handsome in appearance, roomy without being "tubby," well built, beautifully finished and completely equipped. Speed, 20 miles an hour with a six-cylinder 50 H.P. Fay & Bowen Engine.

We build other sizes of engines and boats, also independent electric lighting units, pumping sets, etc. "None Better Built."

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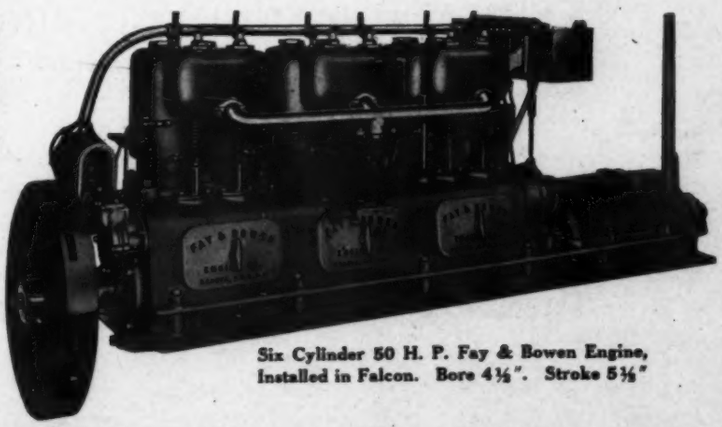

Six Cylinder 50 H. P. Fay & Bowen Engine, Installed in Falcon. Bore 4⅛". Stroke 5⅛"

RELIABILITY F&B

FAY & BOWEN ENGINE COMPANY

104 LAKE STREET, GENEVA, N. Y., U. S. A.

New York Office: 50 Church St., on Concourse, Sutter Bros., Representatives.

Made for Canada by the St. Lawrence Engine Co., Ltd., Brockville, Ont.

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Don't think, just because you have already put your boat in the water, that it is too late to instal a new Kermath Engine. The whole season is ahead of you, and you might just as well have the super-satisfaction of a new up-to-date engine instead of worrying along with your old engine another year.

Think of the thrill of having a brand new power plant that embraces the latest and best ideas of marine engine construction. An engine that will let you enjoy every minute of your cruise, that will make every hour of your week-end a joy,—an engine that will invite you to slip down to the boat house after a hot day in the office,—an engine that starts easily—runs smoothly and is so free from trouble that you'll forget what a monkey wrench looks like.

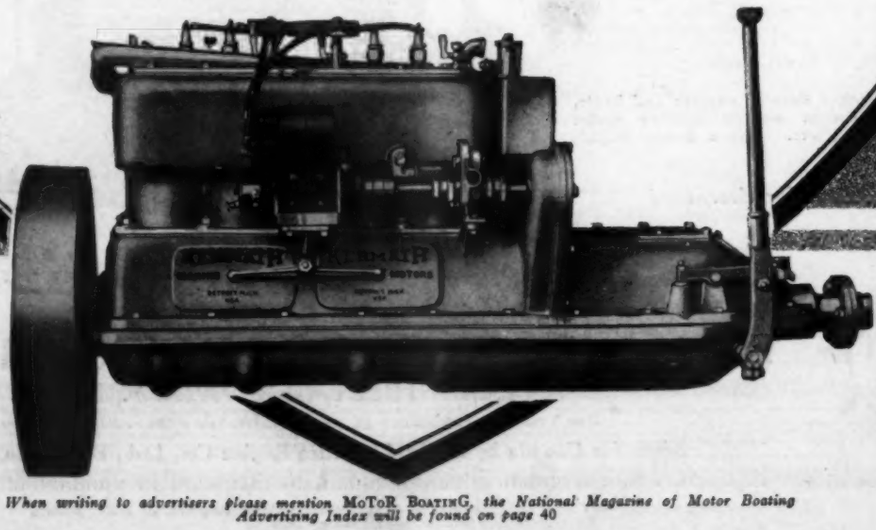
That's the kind of an engine the Kermath is. If you've been tinkering with a marine motor of the old school, there's a big surprise in store for you. Perhaps the old engine served you mighty well, but you'll find that marine engineering has developed wonderfully in the past few years and the old-timer at its best was never equal to the modern Kermath.

Now consider this seriously. Write us today for Kermath information and name of nearest dealer. Don't lose any time getting started because the season is now advancing and you want your engine as quick as you can get it.

Don't deny yourself this pleasure. Write today

KERMATH MANUFACTURING COMPANY

Department 2 **Detroit, Michigan**



10-12 HP
16-18 HP
20-25 HP

$225. to $395.

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